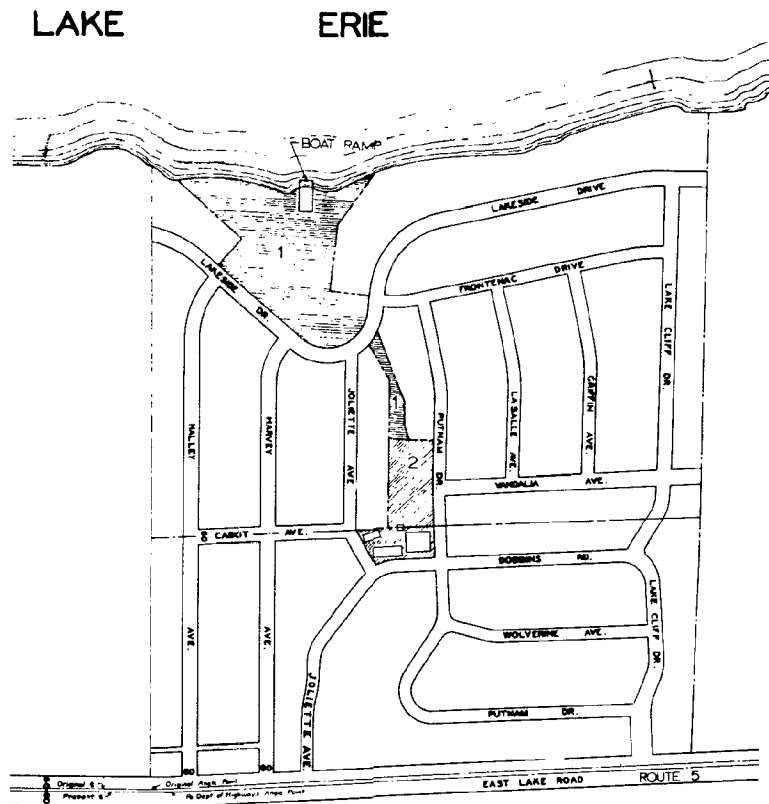


Overman

Coastal Zone Management

Pinus sylvestris

EROSION PROTECTION DESIGN STUDY



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Funded and Coordinated
igh Department of Environmental Resources
Office of Resources Management, Bureau
resources Management, Division of Coast-
ine Management and the Erie County De-
ment of Planning.

Zone

PREPARED BY:
URBAN ENGINEERS, INC.

LAKESIDE RECREATION AREA

EROSION
PROTECTION
DESIGN STUDY /

Prepared For:

LAWRENCE PARK TOWNSHIP BOARD OF COMMISSIONERS

Theodore E. Mohnkern, President

Allen C. Ogden, Vice President

Raymond M. DePlatchett

James E. Conners

C. Kenneth Schnars

Prepared By:

URBAN ENGINEERS, INC.

The preparation of this report was funded and coordinated through the Pennsylvania Department of Environmental Resources, Office of Resources Management, Bureau of Resources Management, Division of Coastal Zone Management and the Erie County Department of Planning.

NOVEMBER 1985

QE 571 . L35 1985 c.2

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I. INTRODUCTION

Recognizing the need for water related recreational activities, the Township of Lawrence Park wishes to expand the existing recreation site along the shore of Lake Erie. In September of 1982 a Feasibility and Design Study to develop a Recreation Master Plan for the Lakeside Recreation Area was completed. The study outlined and recommended various recreational facilities to be constructed within the township owned Lakeside Recreation Area property. As part of the Phase I Development plan, an expanded boat launching ramp and public swimming area are recommended for the Lake Shore area. Prior to the development of these facilities it will be necessary to curtail the continual shore line erosion experienced at the site.

On February 6, 1985, Lawrence Park Township entered into an agreement with the County of Erie to conduct an Erosion Protection Design Study for the purpose of:

1. Evaluating the causes of the Shore Line Erosion.
2. Developing Alternative Erosion Protection Facilities.
3. Designing a Cost Effective Erosion Protection System.
4. Preparing Final Plans and Specifications for Construction.

Funds for this design study are being provided by the Pennsylvania Department of Environmental Resources through the Coastal Zone Management Program.

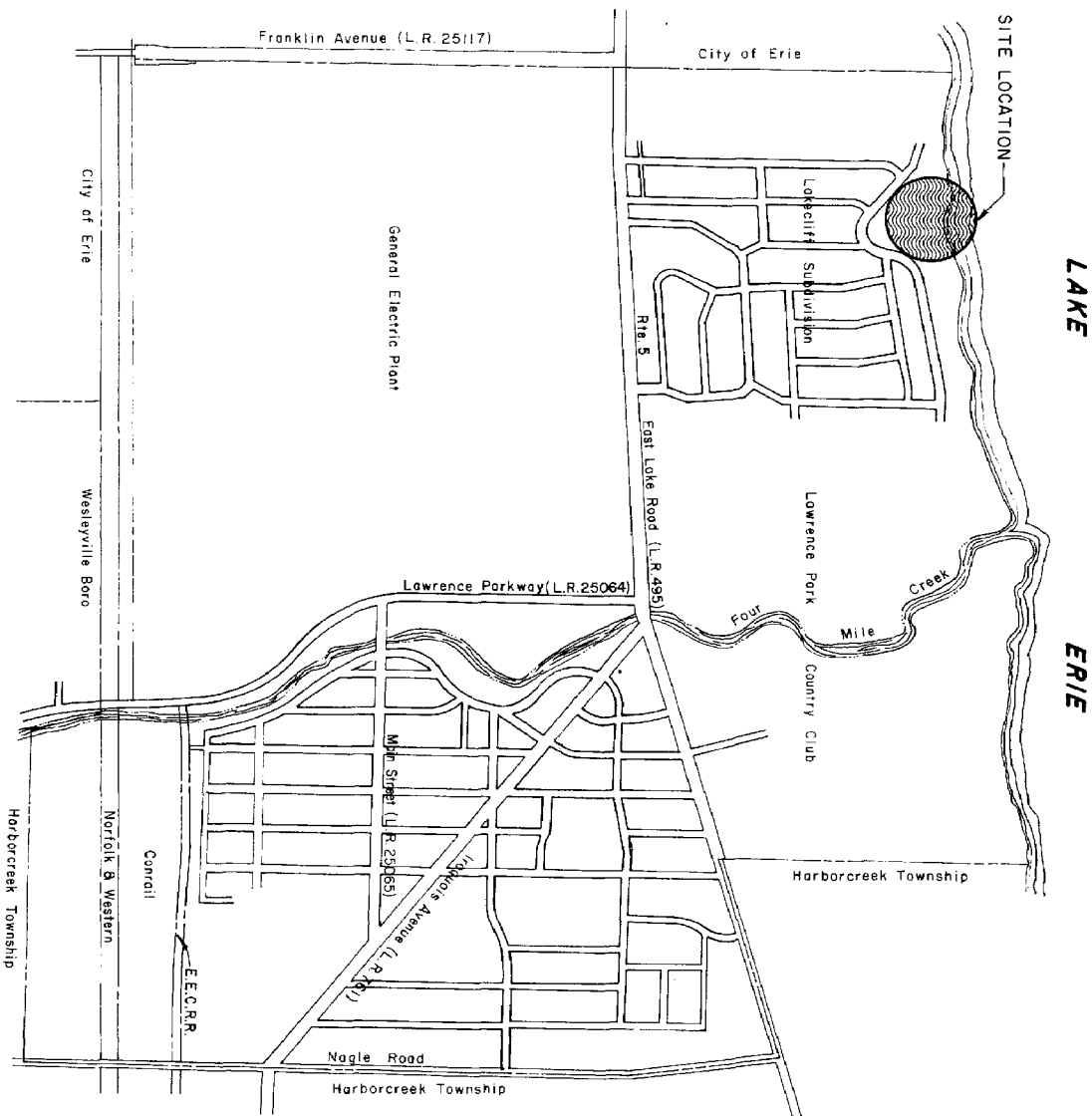
II. STUDY AREA

Location

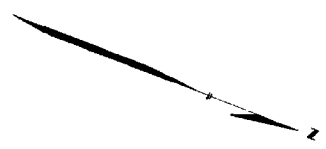
The study site is located along the Lake Erie shoreline and is part of the 9.25 acre Lakeside Recreation Area in the Lake Cliff Park Subdivision of Lawrence Park Township, Erie County, Pennsylvania (Plate 1).

Site Description

The beach averages 50 feet in width along the shoreline of the project area and is composed of natural sand deposited due to the shallow cove configuration and the existing groin. This area is backed by a steep, 25 foot high bluff vegetated with shrubs and grass. The site facilities (Plate 2) consist of a 60 foot long by 3 foot wide precast concrete block groin adjacent to a small limited boat launch ramp accessed by a gravel road. At the easterly end of the site both a 30 inch and a 36 inch diameter storm sewer discharge to the lake.



LAWRENCE PARK TOWNSHIP
 Scale 1"=1000'



PROJECT LOCATION MAP
LAKE SIDE RECREATION AREA
EROSION PROTECTION
DESIGN STUDY

URBAN ENGINEERS, INC.
 ERIE, PENNSYLVANIA

III. EROSION PROCESS

Erosion and accretion are the two aspects of the same process involving a changing shoreline which may occur at extremely slow rates or make dramatic changes within a human lifetime. If erosion is not balanced by accretion, the shore will be washed away.

Wave motion, particularly that of breaking waves, is the most important active agent in the building and erosion of a shoreline. Waves are produced by wind blowing across the water. The longer the distance or fetch available, the longer the waves.

Within the wave, a water particle moves in small vertical circles and keeps returning to its starting point, while the form energy of the wave moves forward. As the wave moves toward shore, it begins to drag on the bottom, which eventually causes it to break or collapse. This produces a great deal of turbulence, stirring up material from the bottom or eroding it from banks and bluffs.

The waves break, run up the shore and return, this action first carrying sedimentary material toward the shore then away. The sedimentary material, called littoral drift, moves in a series of zig-zags along the shore guided by the longshore current which is produced by the successive wave fronts arriving at the shore on an angle. At the Lakeside Recreation Area, the littoral drift generally moves in a west to east direction.

Frequently, attempts to reduce erosion and build up the sand in one area will interrupt the movement of material along the shoreline thereby increasing erosion in an adjacent area.

Storm water erosion differs from the shoreline erosion process only in the manner of transport. Storm water flows are generally confined to channels which control the direction of movement.

The Lakeside Recreation Area has two problem areas connected with the erosion process and one caused by accretion. The boat launch ramp is the focus of these opposing forces. The existing groin is serving its design purpose of protecting the ramp from west-northwest waves quite adequately, however, the accumulation of material on the west side of the groin is transported around the shore end of the groin and is deposited on the boat ramp. The net result is continual maintenance required to remove the sand from the ramp to keep the facility operational.

The erosion induced problem is of much greater importance. The boat launch ramp suffers from scouring of the sand beneath it and the subsequent reduction in structural strength. The damage is caused by waves generated by northeast storms and storm water run-off down the ramp.

The second major erosion related problem is not associated with the lake process. Approximately 75 feet east of the boat ramp is the location of two large (30 and 36 inch) storm sewer outfalls. The pipe inverts are situated near the top of the bluff.

The high water velocity result in erosion at the toe of the bluff and in the initial portion of the channel. The composition of the shoreline is such that the discharge channel to the lake is not permanent but rather, random and varying.

The project site is fortunate in that a beach does exist to provide protection to the bluff. In addition, the bluff is composed primarily of shale and not of a silt soil. The erosion of the bluff, usually the paramount problem at area lake front sites, is occasioned at this site only by large storms and then only to a limited extent.

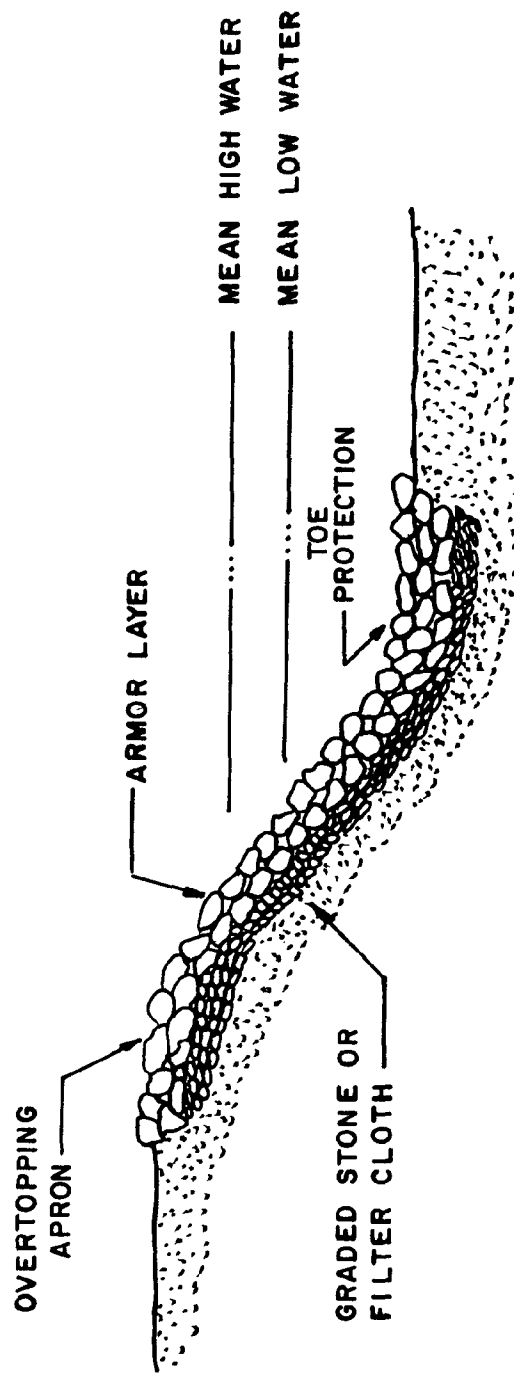
IV. ENGINEERING STUDY

Three basic choices are available when evaluating erosion problem action alternatives: no action, relocation of structures and corrective measures. Through the September 1982 study, the Township indicated a desire to maintain and expand existing facilities, therefore, the no action alternate and the relocation alternate are not considered options.

The third option, corrective measures, can be broken down into three categories: Those that directly armor the shore, those that dissipate wave energy, and those that retain earth slopes against sliding. The following section summarizes the various structures, their uses and their advantages and disadvantages.

Revetments (Plate 3), placed on banks or bluffs, protect the shore and the land behind them by absorbing the energy of incoming waves. The rough surface of the revetment offers more resistance to the water flow and hence retards water run-up on the slope. The wave energy is dissipated within the armored zone and the slope remains undisturbed.

Revetments are effective in absorbing wave energy and reducing wave run-up. The advantages to this type of protection include being well suited to stage construction; they are easily repaired; and are low in maintenance costs. The limitations include: heavy equipment is required for construction; they have a moderately high first cost and there is limited beach access.



TYPICAL REVETMENT SECTION

NO SCALE

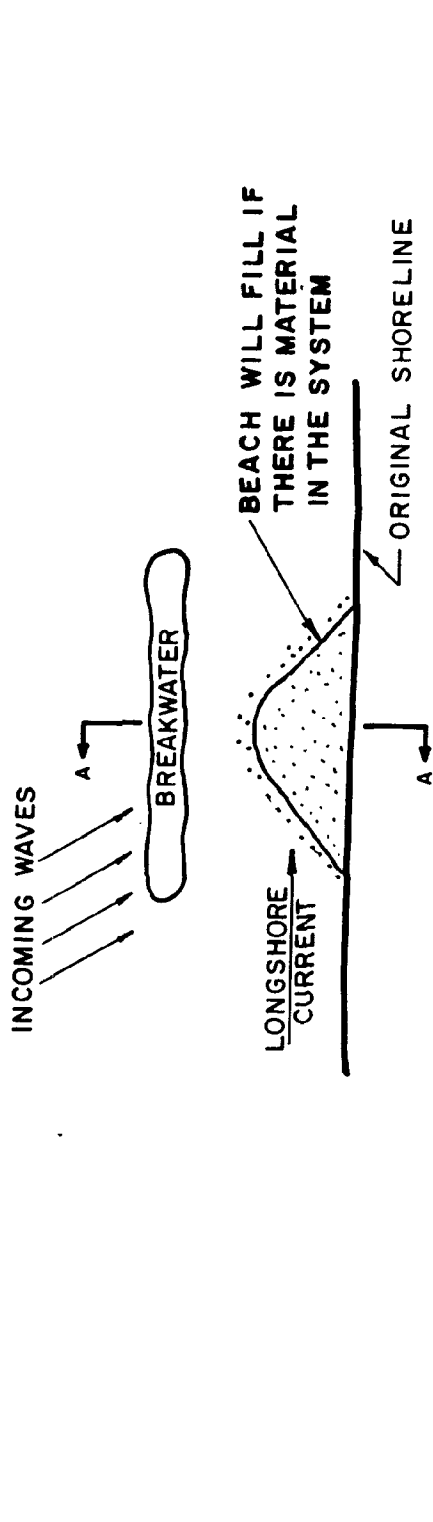
Breakwaters (Plate 4), fixed or floating, placed offshore to dissipate the energy of incoming waves will also provide shore protection. Fixed breakwaters are large quantities of dense material that bear on the lake bottom; while buoyant materials, ie., hollow concrete boxes, logs or scrap tires are utilized in the construction of floating breakwaters.

Breakwaters can exert a beneficial effect over a considerable length of shoreline. The recreational value of the breakwater site is enhanced as a natural beach is built between the breakwater and the shore.

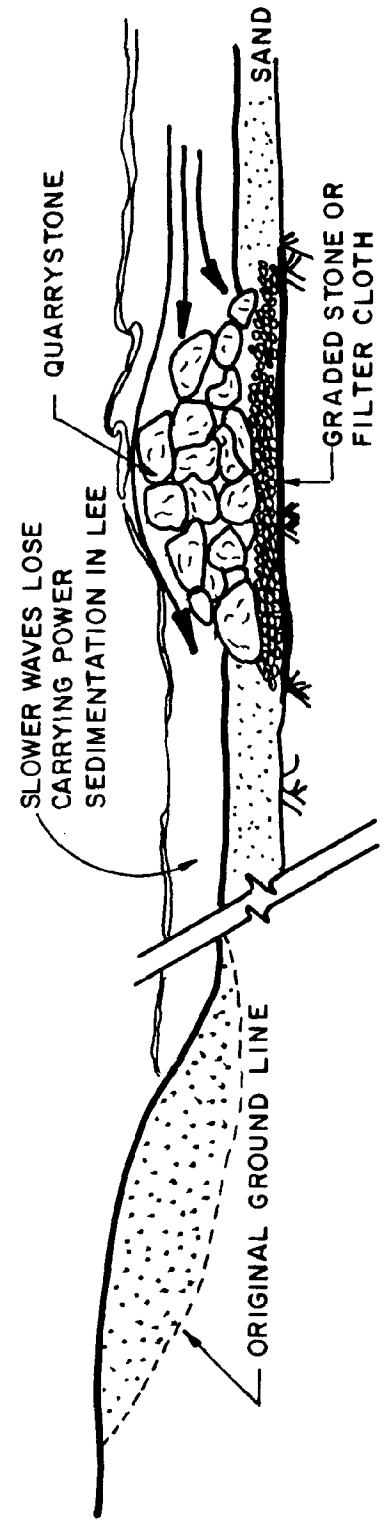
As with other attempts to control a very dynamic environment, a breakwater may modify the beach line and cause erosion in down drift areas. In addition, breakwater initial cost can be high due to the need for floating heavy equipment and any subsequent repairs can be extremely difficult.

Groins (Plate 5) are generally installed perpendicular to and extending from the shoreline with the purpose of trapping and retaining the littoral drift material. The enlarged beach area increases erosion protection for the bluff and inland areas by serving as a wave energy dissipator.

The chief advantages of groins are the erosion protection provided for upland areas, recreational benefits of a larger, stabilized beach, moderate first cost and low maintenance cost. On the other hand, groins rarely function strictly as intended in that areas down drift will probably experience erosion.



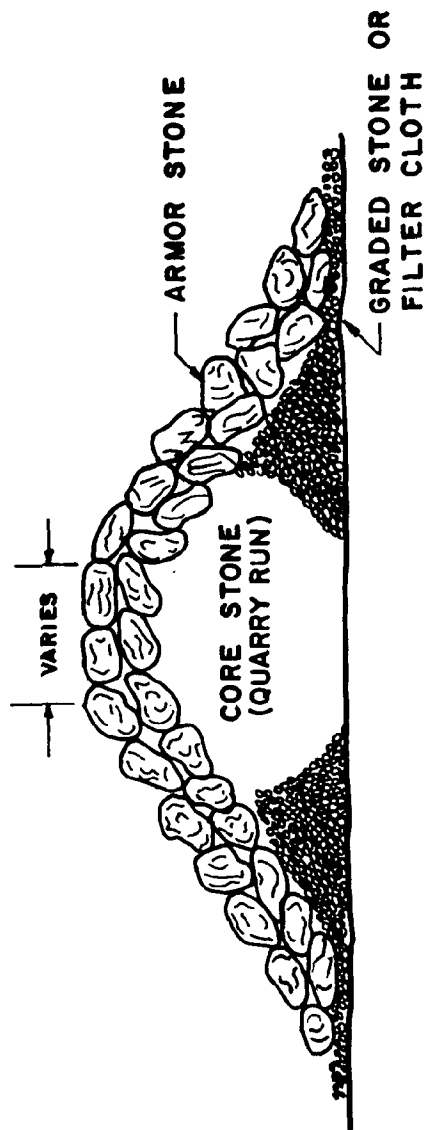
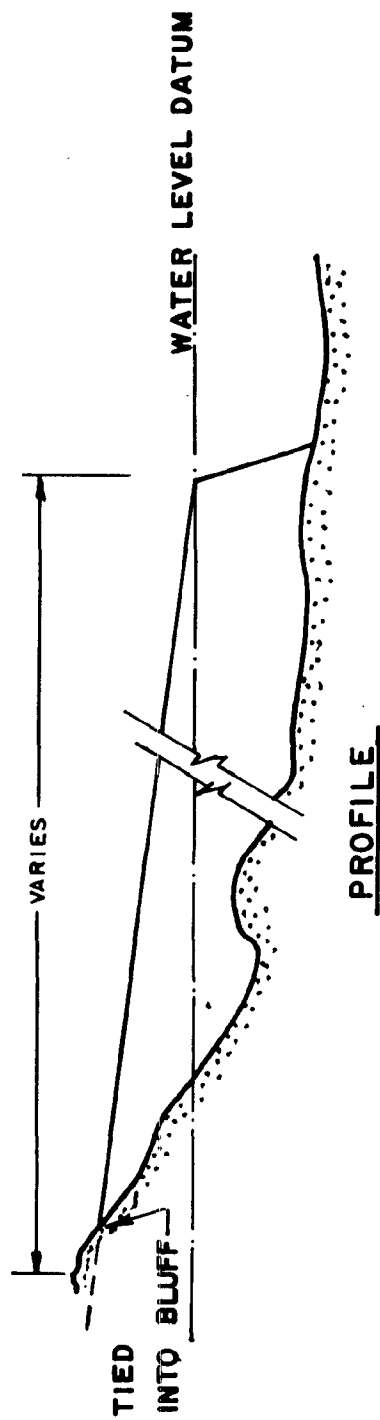
PLAN VIEW



SECTION A-A

TYPICAL QUARRYSTONE BREAKWATER

NO SCALE



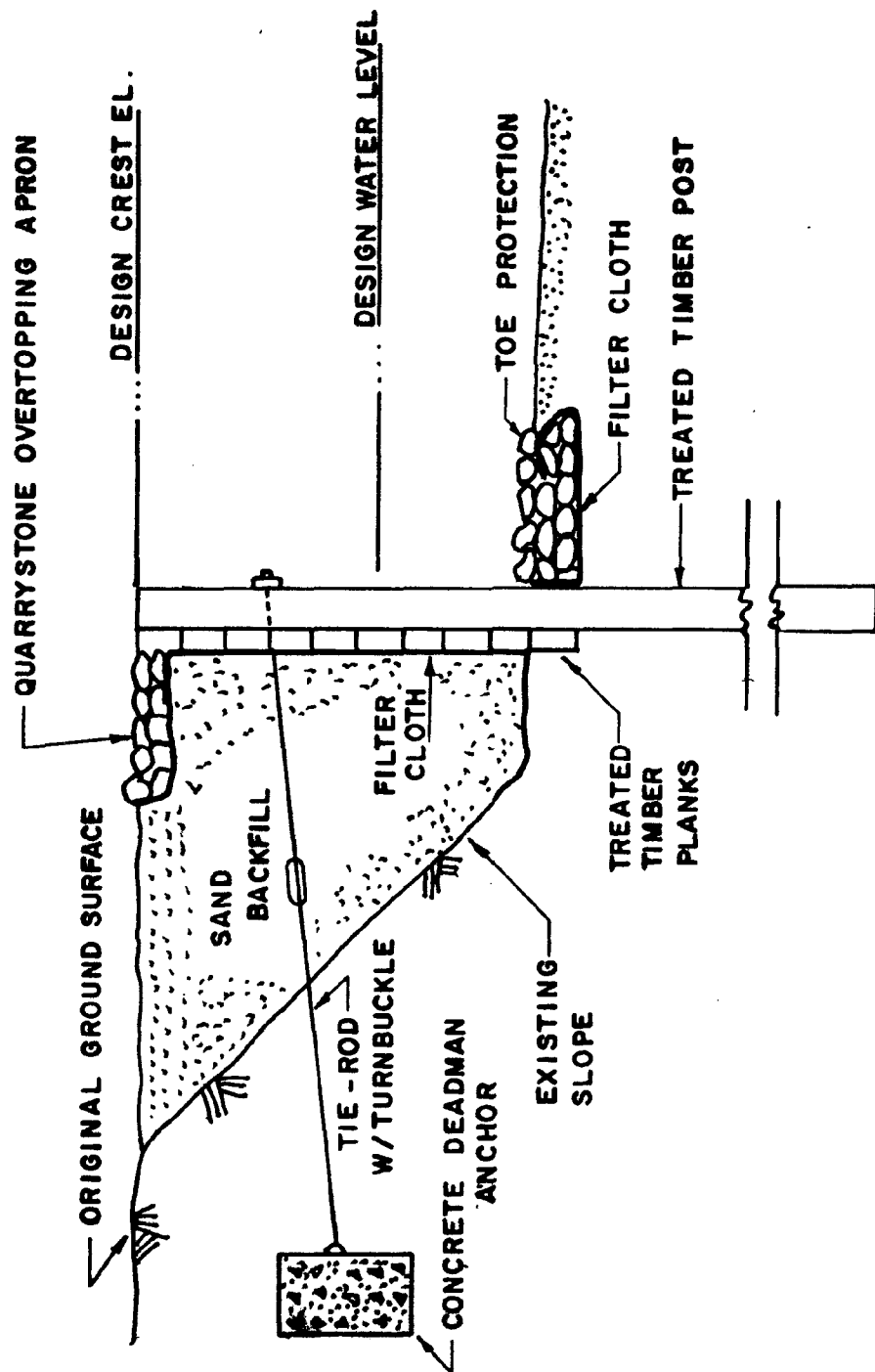
TYPICAL PERMEABLE GROIN

NO SCALE

The final type of structure to be considered is a bulkhead. Bulkheads (Plate 6) are placed at the toe of a bluff parallel to the shoreline with the primary purpose of serving as a retaining wall. A secondary benefit is the protection afforded the slope from wave action.

The construction of bulkheads follow the pattern of retaining walls utilizing either sheet pile, pile supported or passive gravity construction.

Bulkheads are most appropriate where fishing and boating are the primary uses of the shore and gently sloping areas for sunbathing or shallow water swimming are not essential. This type of structure provides substantial protection and maintains the shoreline in a fixed position. Depending on the wall type, maintenance cost can be low and the materials readily available. Disadvantages include scour protection requirements at the toe, the limiting of use and access to the beach and high first costs.



TYPICAL TIMBER BULKHEAD

NO SCALE

V. EVALUATION AND RECOMMENDATIONS

Based on the intended use of the Lakeside Recreation Area, as indicated by the Feasibility and Design Study of September 1982, the primary uses of the shore area are swimming and boat access. The desired use of the shore area provides the basic criteria for selection of a recommended shoreline protection device. Revetments and bulkheads do not lend themselves to beach access and the breakwater alternative, beside being expensive, will accumulate sand on the shoreward side of the structure which can diminish boat access.

A groin has several effects which make it the most attractive of the various options. A new groin, located approximately 200 feet east of the existing groin would serve to increase the beach size by trapping sand moved by the bottom drift. The longer beach will enhance the recreational aspects of the site, provide some northeast storm protection for the boat ramp, and increase the erosion protection of the bluff. Due to the mechanics of a groin field ie., accretion on the updrift side and erosion on the downdrift side, the boat launching area would be naturally kept open.

To minimize erosion of downdrift beach areas it is recommended that the new groin be permeable to allow for some material passage.

The existing groin at the boat ramp should be extended shoreward and tied into the bluff. This barrier would act to keep the sand from washing onto the boat ramp from the westerly shore.

The beach formed by the new groin will provide protection to the boat ramp from scouring due to the wave action of northeasterly storms. In addition, catch basins at the top of the ramp are recommended to collect storm water on the ramp and the access road eliminating the erosion on the sides and end of the ramp.

Finally, to handle the problems due to the storm sewer outfalls the following is recommended: reroute the drainage via pipes eastward to a new discharge east of the proposed groin. The short channel to the lake should be protected to minimize erosion.

To implement these recommendations, close coordination with the Pennsylvania Department of Environmental Resources and the U.S. Army Corps of Engineers will be necessary. Construction permits from both agencies will also be required. The appendix contains copies of the completed permit applications.

VI. Design Considerations

The purpose of this section is to expand on the recommendations developed earlier in this report and provide a bridge between the general recommendations and the specific design features contained in the accompanying plans (Plates 7,8 & 9) and specifications.

Groins

The criteria to be examined in the design of a groin include material, constructability, cost, servicability, maintenance and aesthetics. As shown on Plate 5, quarry stone is frequently used for the construction of groins and breakwaters. The Erie area, however, has no reasonably accessible supply of the large stone needed in this type of construction. Stacked bag groins can be used, but their use is recommended for waves up to 5 feet in height. The waves produced on Lake Erie frequently exceed this height. Steel pile groins are not practical from a cost point of view.

The existing groin is constructed of precast concrete block, 2' x 3' x 6', held together by steel pins. It has performed very satisfactorily for the 11 years since its installation.

Several other of the selection criteria are well satisfied by adopting the earlier design: the material is readily available; cost is moderate; maintenance is minimal; and the aesthetics of the site would be well served by using the same approach. Constructability problems are no greater than those encountered in lake related construction with any other type of material.

The precast concrete block construction also facilitates the inclusion of material passage openings which reduce the chance of downdrift erosion due to beach starvation.

Boat Ramp

The existing boat ramp, constructed on sand, has sustained considerable damage over the years and needs a replacement. Although scour protection is to be provided by the new groin and a storm water collection system, additional protection is being built in to the new ramp itself (Plate 7). The design approach combines the need for a new ramp with the extension of the existing groin. The proposed ramp is constructed on top of the precast concrete blocks used in the groin construction. The concrete blocks will provide the scour protection necessary to maintain the structural integrity of the ramp.

The ramp is curbed to assist in keeping sand off, as well as, preventing any runoff by-passing the catch basins from eroding the material along the sides of the ramp and keeping the boat trailers on the ramp.

Runoff Containment

The elimination of the channel through the center of the beach requires the modification of the existing storm water discharge system. The plan calls for the tubing of the discharge flows (Plate 8) parallel to the shore to a point east of the new groin. At times of peak storm water discharge, velocities will be very high requiring adequate facilities to direct flows around

the beach area (Plate 9). A short protection channel will convey the flows to the lake proper.

Monitoring and Maintenance

The new groin is designed to be permeable, however, the possibility of scour down drift is still high. A monitoring program is recommended to check on the shore conditions after construction. If excessive scour does develop sand should be imported and placed on the east side of the new groin. This procedure may have to be repeated periodically until the system stabilizes. The township could be liable for erosion damages caused by the placement of the new groin and should be prepared to continually import and deposit sand east of the new groin as the system may never stabilize.

VII. CONSTRUCTION DOCUMENTS

The plans and specifications for the construction of the work proposed earlier in this report have been developed using good, standard engineering practice and U.S. Army Corps of Engineers, Pennsylvania Department of Environmental Resources and Pennsylvania Department of Transportation requirements and standards consistent with the individual requirements of the site.

The specifications, including the bid documents and general conditions, as well as, the technical specifications, are contained in the Appendix.

The plans, consisting of Plates 2,7,8, and 9, can be found in the pocket inside the back cover of this report.

APPENDIX

APPLICATION FOR A DEPARTMENT OF THE ARMY PERMIT
For use of this form, see EP 1145-2-1

OMB APPROVAL NO. 0702-0036
Expires 30 September 1983

The Department of the Army permit program is authorized by Section 10 of the River and Harbor Act of 1899, Section 404 of P. L. 92-500 and Section 103 of P. L. 92-532. These laws require permits authorizing structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided in ENG Form 4345 will be used in evaluating the application for a permit. Information in the application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and checklist) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. Application number (To be assigned by Corps) 	2. Date <div style="text-align: center;"> <u>4</u> <u>85</u> Day Mo. Yr. </div>	3. For Corps use only. 														
4. Name and address of applicant. Lawrence Park Township 864 Silliman Ave. Erie, PA 16511 Telephone no. during business hours A/C (814) <u>899-2305</u> A/C () _____	5. Name, address and title of authorized agent. C.K. Schnars Recreation Commissioner Same as Item 4 Telephone no. during business hours A/C (814) <u>899-2305</u> A/C () _____															
6. Describe in detail the proposed activity, its purpose and intended use (private, public, commercial or other) including description of the type of structures, if any to be erected on fills, or pile or float-supported platforms, the type, composition and quantity of materials to be discharged or dumped and means of conveyance, and the source of discharge or fill material. If additional space is needed, use Block 14. <p>The existing boat ramp will be demolished and a new one constructed using an extension of the existing groin as a foundation. This approach will help prevent scouring under the new ramp and reduce maintenance by keeping the ramp clean of sand. A new precast concrete block groin will be constructed 200 feet east of the existing structure.</p>																
7. Names, addresses and telephone numbers of adjoining property owners, lessees, etc., whose property also adjoins the waterway. <table style="width:100%; border: none;"> <tr> <td>Peter Alex 2300 Lakeside Dr.</td> <td>Richard Graham 2306 Lakeside Dr.</td> <td>Kurt Fehrle 2608 Lakeside Dr.</td> </tr> <tr> <td>James & Laura Nickell 2302 Lakeside Dr.</td> <td>Paul E. Kreger 2308 Lakeside Dr.</td> <td>Robert J. Kilgore 2612 Lakeside Dr.</td> </tr> <tr> <td>William Lee 2304 Lakeside Dr.</td> <td>Burt Rutkowski 2604 Lakeside Dr.</td> <td>Mrs. Ray Beaver 2618 Lakeside Dr.</td> </tr> </table> <p align="right">(Con't. Block 14)</p>			Peter Alex 2300 Lakeside Dr.	Richard Graham 2306 Lakeside Dr.	Kurt Fehrle 2608 Lakeside Dr.	James & Laura Nickell 2302 Lakeside Dr.	Paul E. Kreger 2308 Lakeside Dr.	Robert J. Kilgore 2612 Lakeside Dr.	William Lee 2304 Lakeside Dr.	Burt Rutkowski 2604 Lakeside Dr.	Mrs. Ray Beaver 2618 Lakeside Dr.					
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8. Location where proposed activity exists or will occur. <table style="width:100%; border: none;"> <tr> <td style="width:50%;"> Address: <u>Lakeside Drive</u> Street, road or other descriptive location <u>Lawrence Park Township</u> In or near city or town <u>Erie</u> <u>PA</u> <u>16511</u> County State Zip Code </td> <td style="width:50%;"> Tax Assessors Description: (If known) <table style="width:100%; border: none;"> <tr> <td style="text-align: center;"><u>1</u></td> <td style="text-align: center;"><u>43</u></td> </tr> <tr> <td style="text-align: center;">Map No.</td> <td style="text-align: center;">Subdiv. No.</td> </tr> <tr> <td style="text-align: center;">____</td> <td style="text-align: center;">____</td> </tr> <tr> <td style="text-align: center;">Sec.</td> <td style="text-align: center;">Twp.</td> </tr> <tr> <td style="text-align: center;">____</td> <td style="text-align: center;">____</td> </tr> <tr> <td style="text-align: center;">Rge.</td> <td style="text-align: center;">____</td> </tr> </table> </td> </tr> </table>			Address: <u>Lakeside Drive</u> Street, road or other descriptive location <u>Lawrence Park Township</u> In or near city or town <u>Erie</u> <u>PA</u> <u>16511</u> County State Zip Code	Tax Assessors Description: (If known) <table style="width:100%; border: none;"> <tr> <td style="text-align: center;"><u>1</u></td> <td style="text-align: center;"><u>43</u></td> </tr> <tr> <td style="text-align: center;">Map No.</td> <td style="text-align: center;">Subdiv. No.</td> </tr> <tr> <td style="text-align: center;">____</td> <td style="text-align: center;">____</td> </tr> <tr> <td style="text-align: center;">Sec.</td> <td style="text-align: center;">Twp.</td> </tr> <tr> <td style="text-align: center;">____</td> <td style="text-align: center;">____</td> </tr> <tr> <td style="text-align: center;">Rge.</td> <td style="text-align: center;">____</td> </tr> </table>	<u>1</u>	<u>43</u>	Map No.	Subdiv. No.	____	____	Sec.	Twp.	____	____	Rge.	____
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Map No.	Subdiv. No.															
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Rge.	____															
9. Name of waterway at location of the activity. <p align="center">Lake Erie</p>																

10. Date activity is proposed to commence. May 1986
Date activity is expected to be completed July 1986

11. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "Yes" give reasons in the remark section. Month and year the activity was completed
_____. Indicate the existing work on the drawings.

12. List all approvals or certifications required by other federal, interstate, state or local agencies for any structures, construction, discharges, deposits or other activities described in this application.

<u>Issuing Agency</u>	<u>Type Approval</u>	<u>Identification No.</u>	<u>Date of Application</u>	<u>Date of Approval</u>
Commonwealth of Pennsylvania Dept. of Environ- mental Resources				

13. Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein?

☐ Yes ☒ No (If "Yes" explain in remarks)

14. Remarks or additional information. (Con't. from block 6)
The new groin is to provide a larger beach to protect the bluff and the new ramp. In addition, the site is being developed as a multi-use recreation facility and a swimming beach is planned. As part of the erosion protection plan, the storm sewers discharging near the top of the bluff are to be re-routed to a discharge point east of the groin. Approximately 280 cubic yards of fill will be required to cover the pipes. Slope protection is to be provided by the application of "Enkammat" soil reinforcement. Source of the fill material will be a local gravel pit selected by the successful bidder.

(Con't. from block 7)

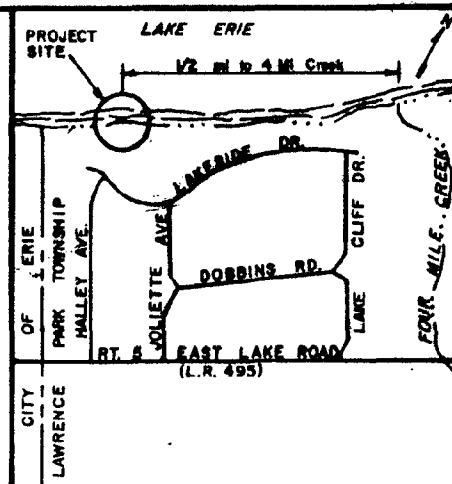
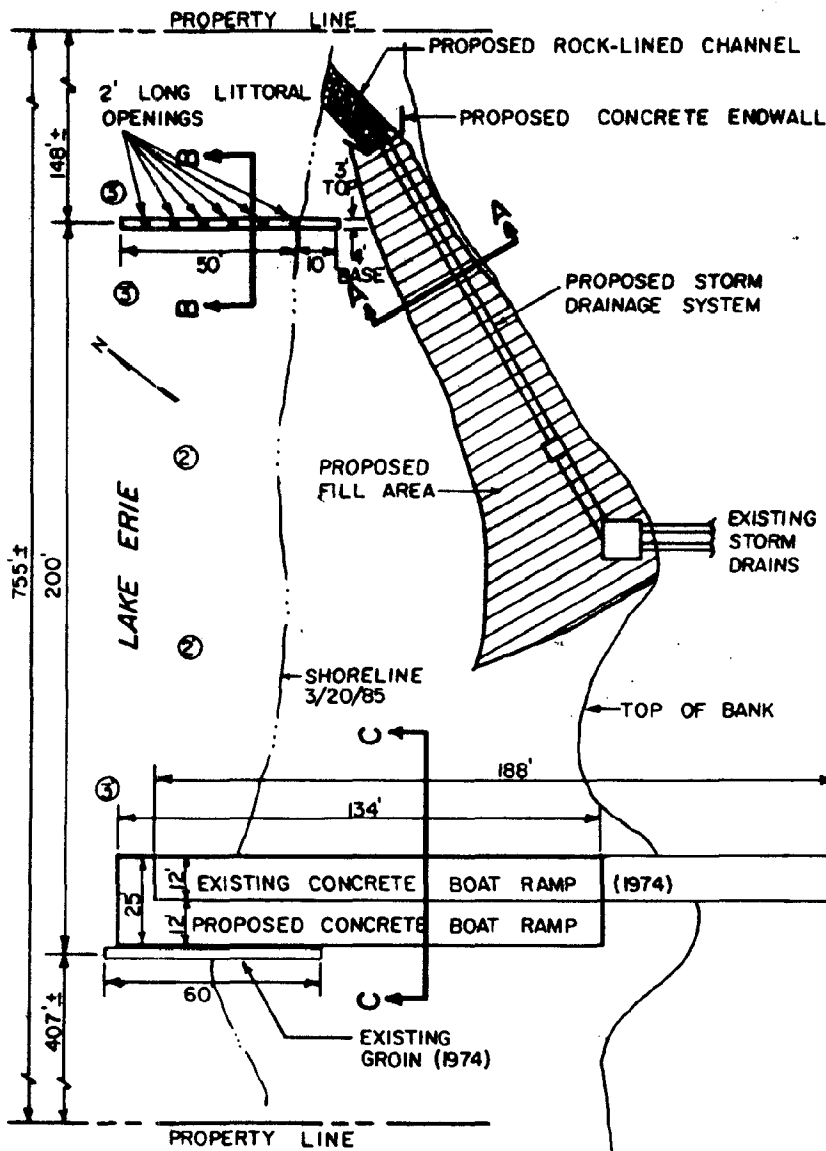
Anthony T. Merski	Leo R. Kaminski
2624 Lakeside Dr.	2628 Lakeside Dr.

15. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent

The application must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 5) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application.

18 U. S. C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than five years, or both. Do not send a permit processing fee with this application. The appropriate fee will be assessed when a permit is issued.



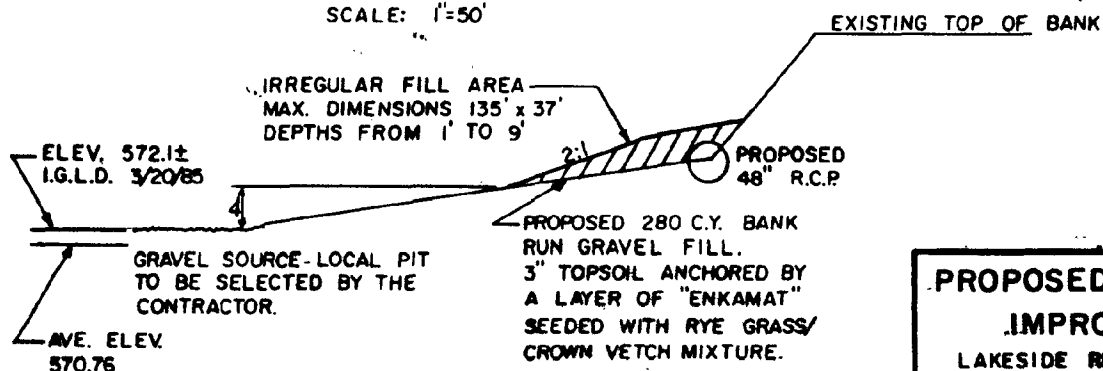
VICINITY MAP

SCALE: 1"=2000'

NOTE: FOR ADJOINING PROPERTY OWNERS, SEE ATTACHED TABULATION.
SOUNDINGS ARE SHOWN BY (X) AND ARE BASED ON THE LAKE LEVEL ON 3/20/85

PLAN OF PROPOSED SHORELINE IMPROVEMENTS

SCALE: 1"=50'

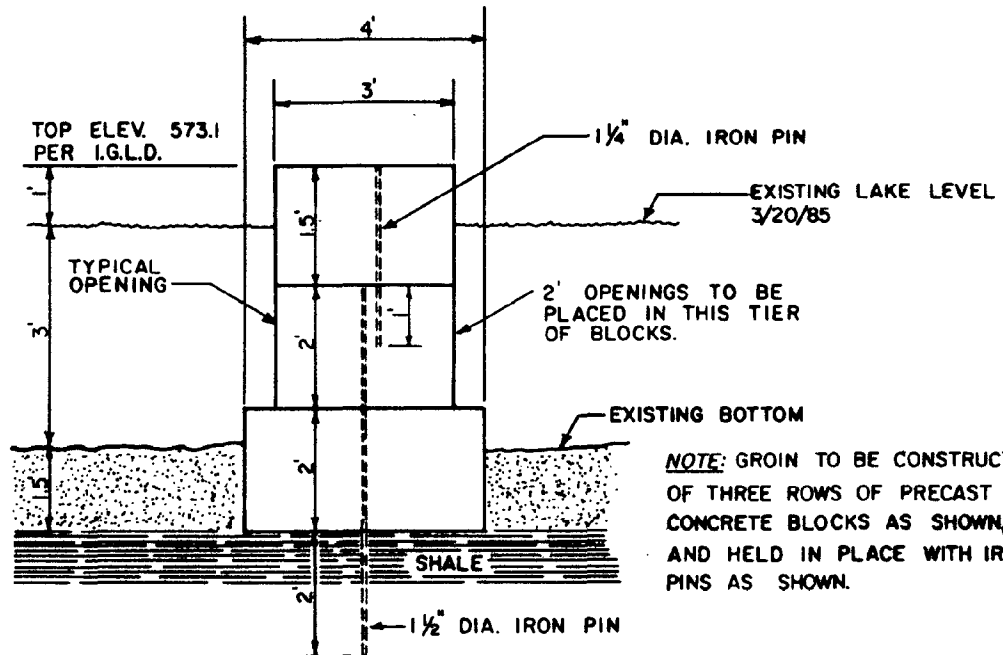


SECTION A-A

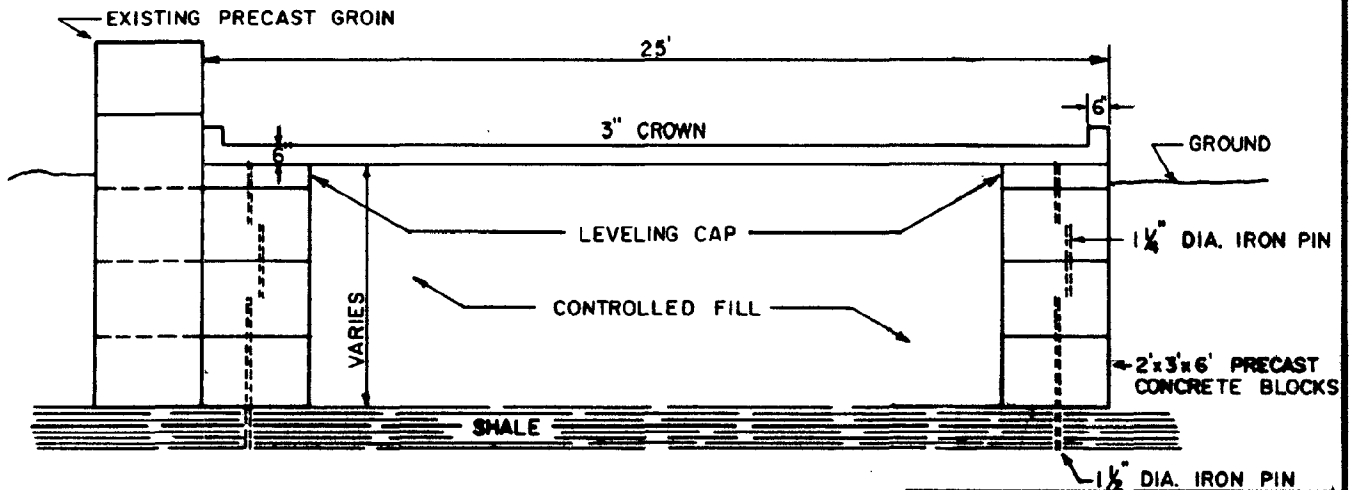
SCALE: 1"=20'

PROPOSED SHORELINE IMPROVEMENTS

LAKESIDE RECREATION AREA
LAWRENCE PARK TOWNSHIP
ERIE COUNTY, PENNSYLVANIA
APRIL, 1985
URBAN ENGINEERS, INC.



PROPOSED GROIN
SECTION B-B
SCALE 1"=3'



PROPOSED REBUILT RAMP
SECTION C-C
SCALE 1"=5'

PROPOSED SHORELINE
IMPROVEMENTS

LAKESIDE RECREATION AREA
LAWRENCE PARK TOWNSHIP
ERIE COUNTY, PENNSYLVANIA
APRIL, 1985
URBAN ENGINEERS, INC.

ADJACENT PROPERTY OWNERS

<u>Name</u>	<u>Address</u>
Peter Alex	2300 Lakeside Dr.
James & Laura Nickell	2302 " "
William Lee	2304 " "
Richard Graham	2306 " "
Paul E. Kreger	2308 " "
Bart Rutkowski	2604 " "
Kurt Fehrle	2608 " "
Robert J. Kilgore	2612 " "
Mrs. Ray Beaver	2618 " "
Anthony T. Merski	2624 " "
Leo R. Kaminski	2628 " "

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

APPLICATION FOR DAM OR WATER OBSTRUCTION PERMIT

....., 19

In compliance with the provisions of the Act of November 26, 1978, P.L. 1375, *as amended* (32 P.S. §693.1 *et seq.*) known as the "Dam Safety and Encroachments Act"; Act of October 4, 1978, P.L. 851 (32 P.S. §679.101 *et seq.*), known as the "Flood Plain Management Act"; and the Administrative Code, Act of April 9, 1929, P.L. 177, *as amended*, which empowers the Department of Environmental Resources to exercise certain powers and perform certain duties by law vested in and imposed upon the Water Supply Commission of Pennsylvania, and the Water and Power Resources Board.

.....
Applicant Lawrence Park Township

hereby makes application for the consent or permit of the Department of Environmental Resources to construct, maintain, modify, enlarge or abandon
A boat ramp precast concrete block
.....
groin and storm sewer system.

.....
in, along, or across Lake Erie
(Here state name of stream or other body of water.)

.....
at a point ½ mile West of 4 mile creek
(Here give location, by distance from mouth of stream, county, township, or municipal boundary; also give city, town or township and county in which located.)

.....
Lawrence Park Township, Erie County

.....
for the purpose of replacing an existing boat ramp with provisions for
(Here state fully the purpose, necessity, and description of the proposed obstruction.)

.....
scour and debris control. The new groin is designed to
.....
increase the beach size in order to protect the bluff and
.....
ramp, as well as, providing a stabilized swimming beach.

.....
The re-routing of the storm sewer outfalls requires filling
.....
a portion of the shoreline in order to adequately bury
.....
the pipe.

(Continued on other side)

in accordance with the complete maps, plans, profiles, and specifications filed with this application and made a part hereof.

By: K.C. Schnars
(Print Name)

(814) 899-2305
Telephone No. of Applicant

Township Recreation Commissioner
(Signature and Title)

864 Silliman Ave.
(Address)

Erie, PA 16511

CHECK ONE:

- ☐ Privately Owned ☐ Partnership
☐ Corporation ☒ Government Agency

If privately owned, the individual owner must sign. One or more members authorized to sign on behalf of an entire partnership must sign. For a corporation, signatures of the president, vice president or other responsible official must sign and affix the corporate seal. For political subdivisions, we require signatures of the chief officer or officers, or other responsible officials empowered to sign for the political subdivision with the seal affixed and attested by the clerk.

SEAL:

WITNESS:

.....
If a fictitious name entity, are you registered with the Pennsylvania Department of State? ☐ Yes ☐ No

Effective September 27, 1980, all applications for permits, except those submitted by federal, state, county or municipal agencies, must be accompanied by a check payable to "Commonwealth of Pennsylvania" in accordance with the following schedule:

Dams		Water Obstructions and Encroachments	
*Class A	\$200	Bridges Over 15 foot Span	\$100
Class B	\$200	Enclosures	\$100
Class C	\$ 50	Channel Changes	\$100
		Commercial Dredging	\$100
		All Others	\$ 50

A single application may be submitted or a single permit may be issued for multiple structures and activities which are part of a single project or facility or part of related projects and facilities, located in a single county, constructed, operated, or maintained by the same person or persons. Where a single application covers multiple structures or activities other than a single structure and related maintenance dredging, the application fee shall be the sum of fees set forth above for the applicable structures and activities but shall not exceed \$600. All stream crossings located within a single county for the installation of a public service line shall be treated as a single structure or activity.

Duplicate applications with duplicate set of plans shall be submitted to Department of Environmental Resources, Bureau of Dams and Waterway Management, P. O. Box 2357, Harrisburg, PA 17120.

This application, together with all maps, plans, profiles and specifications, and all papers, information and data filed in connection therewith, will remain on file in the Department.

*Based on size classification as defined in § 105.91 of Chapter 105, Rules and Regulations.

CONSTRUCTION COST ESTIMATE
Proposed Shoreline Improvements
Lakeside Recreation Area
Lawrence Park Township

Item No.	Item	Unit	Quantity	Unit Price	Total Cost
1	Boat Ramp	C.Y.	60	175.00	10,500.00
2	15" Galvanized CMP	L.F.	90	15.00	1,350.00
3	21" Galvanized CMP	L.F.	82	22.00	1,804.00
4	42" Galvanized CMP	L.F.	30	45.00	1,350.00
5	48" Reinforced Concrete Pipe	L.F.	95	77.00	7,315.00
6	Grading & Backfilling	C.Y.	280	8.00	2,240.00
7	Catch Basins	EA.	3	1100.00	3,300.00
8	Rock Excavation	C.Y.	75	30.00	2,250.00
9	Replacement of unstable subgrade	C.Y.	25	20.00	500.00
10	Wood Sheeting & Bracing	MBF	1	660.00	660.00
11	Vault Type 1	EA.	1	Lump Sum	5,000.00
12	Vault Type 2	EA.	1	Lump Sum	3,500.00
13	Endwall	EA.	1	Lump Sum	1,500.00
14	Rock Lined Channel	L.F.	18	20.00	360.00
15	Precast Concrete Groin	EA.	1	Lump Sum	15,000.00
16	Gravel Roadway	S.Y.	275	15.00	4,125.00
17	Formula B Seeding	S.Y.	260	4.00	1,040.00
18	Formula C Seeding	S.Y.	400	12.00	4,800.00
			Sub Total		66,594.00
			15% Contingency		9,989.00
					76,583.00

Literature Cited

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Christensen, Monty I., "Park Planning Handbook", John Wiley & Sons, Inc., New York, 1977.

Def. Quinn, Alonzo, "Design & Construction of Ports & Marine Structures", McGraw-Hill Book Company, New York, 1982.

Great Lakes Research Institute, "Shoreline Erosion and Flooding Erie County", Pennsylvania Department of Environmental Resources, Office of Resources Management, June, 1975.

Urban Engineers, Inc., "Lakeside Recreation Area Feasibility and Design Study", Pennsylvania Department of Environmental Resources, Office of Resources Management September, 1982.

U.S. Army Corps of Engineers, "Low Cost Shore Protection... a Guide for Engineers and Contractors", 1981.

U.S. Department of Transportation, Federal Highway Administration, "Design Charts for Open-Channel Flow", Hydraulic Design Series No. 3, Washington D.C., 1973.

Yoder, E.J., "Principals of Pavement Design", John Wiley & Sons, Inc., New York, 1959.

PROPOSED
SHORELINE IMPROVEMENTS
LAKESIDE RECREATION AREA
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INSTRUCTION TO BIDDERS

1. RECEIPT OF BIDS

The Township of Lawrence Park, Erie County, Pennsylvania, herein the "Owner" invites bids on the attached hereto, all blanks must be appropriately filled in. Bids shall be received up to 4:00 P.M., at the office of the Township Secretary, Mrs. Dolores Bendig, 864 Silliman Avenue, on week days between the hours of 8:00 A.M. and 4:00 P.M., and will be opened on at 7:00 P.M. at the second floor of the Township Building 4102 Main Street, Lawrence Park Township, Erie County, Pennsylvania, at which time they will be opened and read aloud.

The envelope containing the bids must be sealed, addressed to the Township Commissioners, Lawrence Park Twp., Erie Co., PA, 16511 and be designated as "Proposed Shoreline Improvements, Lakeside Recreation Area, Lawrence Park Township, Erie Co., PA".

The Owner may consider informal any bid not prepared and submitted in accordance with the provision hereof and may waive any informalities in or reject any bid and all bids. Any bid may be withdrawn prior to the above-scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

2. PREPARATION OF PROPOSAL

The contractor shall, in the preparation of his proposal, take into account that he will be required to comply with all requirements of the laws and implementing regulations of the Commonwealth of Pennsylvania and of the United States relating to human relations, equal opportunity and non-discrimination in employment, and will pay to workmen employed in the performance of the contract the wages to which they may be entitled and, when required by law, not less than the applicable prevailing wage rates as determined for various crafts or classifications by the Pennsylvania Secretary of Labor and Industry and/or the U.S. Secretary of Labor for this locality in accordance with the Pennsylvania Prevailing Wage Act 442 and/or the Davis-Bacon Act respectively where applicable. The prevailing minimum wage predetermination which may apply to this project are included in the Form of Bid of these specifications.

Proposals must be submitted on the prescribed form, all blank spaces for bid prices must be filled in, in ink, in both words and figures, with the unit price for the item or the lump sum for which the proposal is made.

All bids must be submitted in sealed envelopes, bearing on the outside the name of the bidder, his address, and the name of the project for which the bid is submitted. (If forwarded by mail, the sealed envelope containing the proposal, and marked as directed above, must be enclosed in another envelope addressed as specified in the Proposal Form preferably by Registered Mail.)

3. SEPARATE BIDS

All work included in the proposed project shall be included in one single bid proposal, and will be awarded to a single contractor.

4. QUALIFICATION OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and the data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by or investigation of such bidder fails to satisfy the obligations of the Contract and to complete the work contemplated therein. Condition bids will not be accepted.

5. BID SECURITY

Each bid must be accompanied by cash, by certified check of the bidder, or by a bid bond duly executed by the bidder as Principal, and having as surety thereon a surety company approved by the Owner, in the amount of 10% of the bid. Such cash, checks, or bid bonds, will be returned to all except the three lowest formal bidders, within three days after the formal opening of bids, and the remaining cash, checks, or bid bonds, will be returned to the three lowest bidders within forty-eight (48) hours after the Owner and the accepted bidder have executed the contract, or if no contract has been executed, within sixty (60) days after the date of the opening of bids, upon demand of the bidder at any time thereafter so long as he has not been notified of the acceptance of his bid.

6. FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bond required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, all liquidated damages for such failure or refusal, the security deposited with his bid.

7. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction and labor under which the work is now being or will be performed. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions set forth in his bid. Insofar as possible, the Contractor in the carrying out of his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

8. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing, addressed to Urban Engineers, Inc., 502 West 7th Street, Erie, Pennsylvania, and to be given consideration must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications, which if issued, will be mailed by Registered Mail with return requested to all prospective bidders (at the respective addresses furnished for such purpose) not later than three (3) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any addendum or interpretation shall not relieve any bidder from any obligation under his bid submitted. All addenda so issued shall become part of the contract documents.

9. SECURITY FOR FAITHFUL PERFORMANCE

If the amount of the accepted bid is less than \$5,000, the successful bidder shall furnish to the Owner, a performance bond at 50% of the contract amount conditioned upon the faithful performance of the contract; which bond shall be solely for the benefit of the Owner, shall be in such form as may be approved by the Owner, and shall have as surety thereon a surety company legally authorized to do business in the Commonwealth of Pennsylvania. Said bond shall be furnished before any contract is awarded.

If the amount of the accepted bid is more than \$5,000, the performance bond shall be at 100% of the contract amount.

10. SECURITY FOR PAYMENT OF LABOR AND MATERIAL

The successful bidder shall furnish to the Owner an additional payment bond at one hundred percent (100%) of the contract amount conditioned for the prompt payment of all material furnished or labor supplied or performed in the prosecution of the work; which bond shall be solely for the protection of claimants supplying labor or materials, shall be in such form as may be approved by the Owner, and shall have as surety thereon a surety company legally authorized to do business in the Commonwealth of Pennsylvania. Said bond shall be furnished before any contract is awarded.

11. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified copy of their power of attorney, to sign said bonds.

12. STATE LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable State and Municipal Laws, and rules and regulations of all authorities having jurisdiction over construction work in the locality of the project, shall apply to the contract throughout, and they are deemed to be included herein the same as though written out in full.

13. LOWEST QUALIFIED BIDDER

Bids will be compared on the basis of the lowest total amount for the various items of work at the bid unit prices for the quantities of work indicated in the proposal, or such revised amount of work for which an award is made by the Owner.

14. OBLIGATION OF BIDDER

At the time of the opening of bids, each bidder will be presumed to have inspected the site of the proposed work, the existing structures, and to have read and to be thoroughly familiar with the Plans and Contract Documents (including all addenda). The failure or omission of any bidder to receive or examine any form, instrument or document, shall in no way relieve any bidder from any obligation in respect to his bid.

15. COLLUSIVE AGREEMENT

Each bidder submitting a bid for any portion of the work contemplated by these documents does declare by the submission thereof that he has not entered into a collusive agreement with any person, firm, or corporation in regard to any bid submitted.

GENERAL CONDITIONS

1. Principals and Definitions

- a. Contract Documents. The Contract Documents consist of the Agreement, Instructions to Bidders, General Conditions, the Drawings and the Specifications, Special Conditions and the inclusion of all modifications thereof incorporated in the documents before their execution.
- b. Owner. The person, persons, company, municipality, etc., designated as such in Section No. 1 of Instructions to Bidders.
- c. Engineer. Urban Engineers, Inc., 502 West 7th Street, Erie, Pennsylvania 16502.
- d. Contractor. The person or persons who have contracted for the erection and completion of the work with the Owner.
- e. Subcontractor. The person or persons having a direct contract with the Contractor, and includes one who furnished material worked to a special design according to plans and specifications of this work, but does not include one who merely furnished materials not so worked.
- f. Written Notice. Written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or mailed to the last business address known to him who gives the notice.
- g. Work. Work includes labor or materials or both.
- h. Completion. Full and exact compliance with the provisions and requirements expressed or implied in these specifications and the drawings.
- i. Best. The first grade or quality of the materials specified.
- j. Approved or Equal. When the words "approved", "satisfactory", "or equal", "proper", "as directed", etc., are used, approval, etc., by the Engineer is understood.
- k. Time Limits. All time limits stated in the contract documents are of the essence of the contract. The Laws of Pennsylvania shall govern the construction of this Contract.

2. Drawings and Specifications

The Contract Documents shall be signed in duplicate by the Owner and the Contractor. In case the Owner and the Contractor fail to sign the General Conditions, Special Conditions, Drawings or Specifications, the Engineer shall identify them.

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. It is not intended, however, that materials or work not covered by or properly inferable from any heading, branch, class or trade of the specifications shall be supplied unless distinctly so noted on the drawings. Materials or work described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized standards.

Additional instructions, if necessary for the proper execution of the work, will be furnished, same to be consistent with the true developments of these specifications and the drawings, and reasonably inferable therefrom.

3. Progress Schedule

Within Ten (10) days of the award of a contract, as evidenced by the date appearing on the Agreement, the General Contractor shall submit to the Owner a progress schedule, in form approved by the Engineer, showing the proposed schedule for the work. The schedule shall be in the form of a bar graph, showing the beginning dates and the completion dates of the various elements covered by the contract.

This schedule shall be reviewed from time to time during the prosecution of the work by the Owner; the Engineer and the General Contractor, and shall be revised as mutually agreed upon to reflect a realistic expectation of the progress of the work.

4. Drawings Furnished the Contractor

The Engineer will furnish the Contractor two (2) complete sets of contract drawings and specifications.

The Contractor will keep one copy of all drawings and specifications on the work in good order, available to the Owner and to its representative. Additional sets of drawings desired by the Contractor will be furnished to him at cost.

5. Ownership of Drawings and Models

All drawings, specifications and models furnished by the Engineer are his property. They are not to be used on other work and, with the exception of the signed contract set, are to be returned to him on request, upon completion of the work.

6. Samples

The Contractor shall furnish for approval all samples as directed. The work shall be in accordance with approved samples.

7. Materials, Appliances, and Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power and temporary heat necessary for the execution of the work.

The Contractor shall furnish all necessary transportation, scaffolding, centering, forms and mechanical appliances, and all other means, materials and supplies for properly prosecuting his work, unless otherwise expressly specified.

The Contractor shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

8. Royalties and Patents

The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

9. Permits and Regulations

The Contractor shall obtain and pay for all permits and licenses, and shall give all notices, pay for all fees and comply with all laws, ordinances, rules and regulations bearing on the work.

10. Protection of Work and Property

The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect the Owner's property from injury or loss arising in connection with this Contract. He shall make good any such damage, injury or loss, except such as may be directly due to errors in the Contract Documents or caused by agents or employees of the Owner. He shall adequately protect adjacent property as provided by Law and the Contract Documents.

The Contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of Federal, State and Municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of workmen and the public, and shall post danger signs warning against the hazards created by such features of construction as protruding nails, bad hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials; and he shall designate a responsible member of his organization on the work whose duty shall be the prevention of accidents. The name and position of the person so designated shall be reported to the Engineer by the Contractor.

Special attention is called to rules and regulations of the Occupational Safety and Health Administration which apply to this type of construction.

In an emergency affecting the safety of life or of the work or of adjoining property, the Contractor, without special instructions or authorization from the Engineer or Owner, is hereby permitted to act, at his discretion, to prevent such threatened loss or injury, and he shall so act, without appeal, if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined by agreement or arbitration.

11. Inspection of the Work

The Owner and his representative shall at all times have access to the work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for inspection.

Re-examination of questioned work may be ordered by the Engineer, and if so ordered -- the work must be uncovered by the Contractor. If such work be found in accordance with the Contract Document, the Owner shall pay the cost of re-examination and replacement. If such work be found not in accordance with the Contract Documents, the Contractor shall pay such cost.

12. Foremen and Supervision

The Contractor shall keep on his work a competent superintendent and any necessary assistants, all satisfactory to the Engineer. The superintendent shall not be changed except with the consent of the Engineer, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor in his absence, and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor; other directions shall be so confirmed on written request in each case.

The Contractor shall give efficient supervision of the work, using his best skill and attention. He shall carefully study and compare all drawings, specifications and other instructions, and shall report at once to the Engineer any error, inconsistency or omission which he may discover.

13. Interpretation

Reference shall be made to the drawings for all measurements. Any discrepancy shall at once be reported to the Engineer. Should it appear that work intended to be described or shown is not sufficiently explained in these specifications or the drawings, the Contractor shall apply to the Engineer for additional explanation or drawings which may be necessary, and shall conform to same so far as they shall be consistent with the true development of these specifications or drawings. In no case shall a bid be submitted or any work proceeded with an uncertainty.

The Engineer shall, within a reasonable time, make decisions on all claims of the Contractor and all other matters relating to the execution and progress of the work or interpretation of the specifications and drawings.

14. Changes in the Work

The Owner, without invalidating the Contract, may make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract, except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.

No change shall be made unless in pursuance of a written order from the Owner signed by the Engineer, and no claim for an addition to the contract sum shall be valid unless so ordered.

15. Claims for Extra Cost

If the Contractor claims that any instructions by drawings or otherwise involve extra cost under his contract, he shall give the Engineer written notice thereof within a reasonable time after the receipt of such instructions, and in any event, before proceeding to execute the work, except in emergency endangering life or property. No such claims shall be valid unless so made.

16. Deductions for Uncorrected Work

If the Engineer and Owner deem it inexpedient to correct work injured or done not in accordance with the Contract, an equitable deduction from the contract price shall be made therefor.

17. Delays

If the Contractor be delayed in the completion of the work by any act or neglect of the Owner or of any employee of the Owner or by any other contractor employed by the Owner or by changes ordered in the work or by strikes, lockouts, fire, unusual delay by common carriers, unavoidable casualties or by any causes beyond the Contractor's control, or by delay authorized by the Engineer pending arbitration, or by any cause which the Engineer shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Engineer may decide.

18. Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to conform to the Contract, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expenses to the Owner, and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within a reasonable time, fixed by written notice, the Owner may remove them and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten days' time thereafter, the Owner may, upon ten days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

19. Correction of Work after Final Payment

Neither the final certificate nor payment for any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials or workmanship, and he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom which shall appear within a period of one year from date of final payment on the contract. The Owner shall give notice of observed defects with reasonable promptness.

20. Owner's Right to do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this contract, the Owner, after three days' written notice to the Contractor, may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the contractor; provided however, that the Engineer shall approve both such action and the amount charged the Contractor.

21. Owner's Right to Terminate Contract

If the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to sub-contractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of the Contract, then the Owner, upon the certificate of the Engineer that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor seven days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method the Owner may deem expedient. In such cases the Contractor shall not be entitled to receive any further payment until the work is finished. If the expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided and the damage incurred through the Contractor's default shall be certified by the Engineer.

22. Contractor's Right to Stop Work or Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of three months, through no act or fault of the Contractor or of anyone employed by him, or if the Engineer should fail to issue any certificate for payment within seven days after it is due, or if the Owner should fail to pay to the Contractor within seven days of its maturity and presentation, any sum certified by the Engineer or awarded by arbitration, then the Contractor may upon seven days' written notice to the Owner and Engineer, stop work or terminate this contract and recover from the Owner payment for all work executed and any loss sustained upon any plant or materials and reasonable profit and damages.

23. Payments

Payment on account of contracts will be made monthly as the work progresses. All payments will be made by check on the Owner's depository. The Contractor shall submit to the Engineer detailed estimates in triplicate for each payment and if required, receipts or other vouchers showing his payments to sub-contractors. The Contractor shall, before the first application for payment, submit to the Engineer a schedule of values of the various parts of the work including quantities, aggregating the total sum of the contract, divided so as to facilitate payments. This schedule when approved by the Engineer, shall be used as a basis for payments on account.

Payments on account of materials, fixtures or apparatus delivered on the premises for immediate use in the work may be made at the discretion of the Engineer.

Ten Percent of each estimate will be retained until the final acceptance of the work.

No payments on account of contract made to the Contractor, nor partial or entire use of occupancy of the work by the Owner, shall be an acceptance of any work or materials previous to the date of the final certificate. The final certificate will constitute the acceptance of the work by the Engineer, except as to work thereafter found to be defective.

24. Payments Withheld

The Engineer may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any estimate for payment to such extent as may be necessary to protect the Owner from loss on account of defective work not remedied; failure of Contractor to make payments properly to sub-contractors or for material or labor; a reasonable doubt that the contract can be completed for the balance then unpaid.

Should the Contractor fail to promptly pay all sums of money which may be due for any material furnished and labor supplied or performed in the prosecution of the work required under this contract, whether or not the material or labor enter into and become component parts of the work, then the Owner may pay said moneys and deduct the amounts so paid from the payment then or thereafter due the Contractor.

25. Responsibility

The Contractor hereby assumes the obligation to save the Owner harmless and indemnify the Owner from every expense, liability or payment (voluntary payments excepted) by reason of any injury to any persons including death suffered through any act or omission of the Contractor or anyone employed by him, in the prosecution of the work.

It shall be the responsibility of the Contractor to perform all work in compliance with all Federal, State, and local laws, regulations and codes. Special attention is called to the requirements of the Davis-Bacon Act, the Copeland Act, etc. as they pertain to this Contract.

It is hereby understood that all materials, fixtures and apparatus at the site of the work are in the custody and under the full responsibility of the Contractor up to the time the work is accepted as completed.

26. Insurances

The Contractor shall maintain at his expense such coverages as will protect the Owner and Contractor from any and all Public Liability, Property Damage, Employer's Liability and/or Workman's Compensation claims for damages to property and/or personal injury, including death, which may arise from operations under this contract, whether such operations by the contractor or by any subcontractors or anyone directly or indirectly employed by either or them.

27. Policies (Insurance)

The Contractor before starting any work, shall file with the Engineer, subject to approval of the Owner, policies and/or certificates of insurance issued by Insurance Companies approved by the Owner and admitted to do business in the State where the operations for the Owner are to be carried on as follows:

MANUFACTURER'S OR CONTRACTOR'S LIABILITY

Bodily Injury	\$500,000.	Per Occurrence
Property Damage	\$250,000.	Per Occurrence
	\$500,000.	Aggregate

CONTRACTOR'S PROTECTIVE LIABILITY

Bodily Injury	\$500,000.	Per Occurrence
Property Damage	\$250,000.	Per Occurrence
	\$500,000.	Aggregate

COMPLETED OPERATIONS

Bodily Injury	\$500,000.	Per Occurrence
Property Damage	\$250,000.	Per Occurrence
	\$500,000.	Aggregate

CONTRACTUAL LIABILITY

Bodily Injury	\$500,000.	Per Occurrence
Property Damage	\$250,000.	Per Occurrence
	\$500,000.	Aggregate

CONTRACTOR'S AUTOMOBILE LIABILITY

Bodily Injury	\$500,000.	Per Occurrence
Property Damage	\$250,000.	Per Occurrence
	\$500,000.	Aggregate

WORKMEN'S COMPENSATION AND EMPLOYER'S LIABILITY

Statutory

Fire insurance with extended coverage under Builder's Risk Completed Value Form shall be maintained by the Owner in the name of the Owner and Contractor as their respective interests may appear, and inception date of such insurance shall be not later than the date of commencement of construction above the level of the lowest basement floor, except where there is no basement, in which case it shall be no later than the date when construction begins.

28. Damages

If either party to this Contract should suffer damage in any manner because of any wrongful act or neglect of the other party or of anyone employed by him, then he shall be reimbursed by the other party for such damage.

Claims under this clause shall be made in writing to the party liable within reasonable time at the first observance of such damage and not later than the time of final payment, except as expressly stipulated otherwise in the case of faulty work or materials, and shall be adjusted by agreement of arbitration.

29. Surety Bonds

The Contractor shall furnish two separate bonds; the first covering the faithful performance of the contract and the second covering the payment of all obligations arising thereunder, in such form as the Owner may require and with such sureties as he may approve.

The amounts of the bonds shall be as designated in Sections 9 and 10 of the Instructions to Bidders of these specifications.

30. Liens

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof, and if required in either case, an affidavit that so far as he has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the Contractor may, if any sub-contractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remain unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien, including all costs, and a reasonable attorney's fee.

31. Assignment

Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him, hereunder, without the previous written consent of the Owner.

32. Mutual Responsibility of Contractors

Should the Contractor cause damage to any separate contractor on the work, the Contractor agrees, upon notice to settle with such Contractor by agreement or arbitration, if he will so settle. If such separate Contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall defend such proceedings at the Owners expense and, if any judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.

33. Separate Contracts

The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

If any parts of the Contractor's work depends for proper execution or results upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. His failure so to inspect and report shall constitute an acceptance of the other Contractor's work after the execution of his work.

To insure the proper execution of his subsequent work, the Contractor shall measure work already in place and shall at once report to the Engineer any discrepancy between the executed work and the drawings.

34. Subcontracts

The Contractor shall, as soon as practicable after the execution of the contract, notify the Engineer in writing of the names of subcontractors proposed for the principal parts of the work and for such others as the Engineer may direct and shall not employ any that the Engineer may within a reasonable time object to as incompetent or unfit.

If the Contractor has submitted before execution of the contract a list of Subcontractors and the change of any name on such list is required in writing by the Owner after such execution, the contract price shall be increased or diminished by the difference in cost occasioned by such change.

The Engineer shall, on request, furnish to any subcontractors wherever practicable, evidence, of the amounts certified on his account.

The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by him.

Nothing contained in the contract documents shall create any contractual relation between any subcontractors and the Owner.

35. Disputes and Arbitrations

The Engineer is, in the first instance, the interpreter of the conditions of the contract and the judge of its performance. All claims or questions in disputes on matters relating to the execution and progress of the Work or the interpretation of the contract documents shall be submitted to the Engineer in writing, who shall, within a reasonable time, make decisions on same.

The Engineer's decision in matters relating to artistic effect shall be final.

All questions in dispute under this contract, except as to matters relating to artistic effect, shall be submitted to arbitration at the choice of either party to the dispute. The Contractor agrees to push the work vigorously during arbitration proceedings.

The demand for arbitration shall be filed in writing with the Engineer, in the case of an appeal from his decision, within ten (10) days of its receipt and in any other case within a reasonable time after cause thereof and in no case later than the time of final payment, except as to questions arising under "Correction of Work after Final Payment."

Questions in dispute shall be referred to a Board of Arbitration consisting of three persons, one to be selected by the Owner, one to be selected by the Contractor, and these two arbitrators to select the third. The decision of any two of the Board of Arbitrators shall be binding.

The arbitrators, if they deem that the case demands it, are authorized to award to the party whose contention is sustained such sums as they shall deem proper for the time, expenses and trouble incident to the appeal, and if the appeal was taken without reasonable cause, damages for the delay. The arbitrator's compensation shall be \$50.00 per day, unless otherwise provided by the Agreement. The arbitrators shall assess the cost and charges of the arbitration upon either or both parties.

The award of the Board of Arbitration must be in writing, and it shall not be opened to objection on account of the form of the proceedings or the award.

36. Use of Premises

The Contractor shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the Engineer, and shall not unreasonably encumber the premises with his materials.

37. Guarantees

The Contractor shall furnish the Owner guarantees for the several parts of the work as called for in the Specifications. Guarantees, unless otherwise stipulated, to be for a period of one year from the date of completion and acceptance, are to be in writing and shall be signed by the subcontractor and the Contractor, and delivered to the Engineer with the final estimate for payment.

38. Provisions Not Applicable

Any provisions contained in the General Conditions which do not apply to the character of the work, as called for in the drawings and specifications, shall not be binding on the Contractor when so construed by the Engineer.

39. Standard of Quality

The various materials and products mentioned in these specifications are given to establish a standard of quality and cost, and it is not the intent to limit to that one product unless so specifically stated, but rather to set up same as the standard desired or acceptable, and for establishing a basis for quality.

Where proprietary names are used, whether or not followed by the words "or an approved equal", they shall be subject to equals as approved and only as approved by the Engineer.

40. Cleaning Up

The Contractor shall at all times keep the premises free from accumulating of waste material or rubbish caused by his employees or work, and at the completion of the work, he shall remove all his rubbish from and about the work and all his tools, scaffolding and surplus material and shall leave his work "broom clean" or its equivalent, unless more exactly specified. In case of dispute the Owner may remove the rubbish and charge the cost to the several Contractors as the Engineer determines to be just.

In the event any curb, pavement, grass, shrubbery or other items are disturbed by the Contractor during the execution of this Contract, it shall be restored to or better than its original condition and of a quality equal to or better than its original condition prior to the period of the contract. No additional payment shall be allowed for the restoration work unless it is included as a specific item in the Form of Bid in which case it will be included in the field measurements for final payment.

The whole area disturbed by the construction work shall be restored as near as possible to its original condition, except for the improvements called for by the plans and specifications and the Engineer shall be the sole judge as to the satisfactory performance of the work.

41. Equal Employment Opportunity

During the performance of this Contract, the Contractor agrees as follows:

- A. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color or national origin. The Contractor shall comply with all provisions of the Physically Handicapped Act of 1965. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, or national origin.

- C. The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments hereunder, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- D. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.
- E. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Federal Housing Commissioner and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.
- F. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- G. The Contractor will include the portion of the sentence immediately preceding Paragraph "A" and the provisions of Paragraphs "A" thru "G" in every sub-contract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Federal Housing Commissioner may direct as a means of enforcing such provisions, including sanctions for non-compliance: Provided, However, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Federal Housing Commissioner, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

42. Conflict of Interests

No official or employee of the municipality who is authorized in his official capacity to negotiate, make, accept or approve or to take part in such decisions regarding a contract or sub-contract in connection with this project shall have any financial or other personal interest in any such contract or sub-contract.

No person performing services for the municipality in connection with this project shall have a financial or other personal interest other than his employment or retention by the municipality in any contract or sub-contract in connection with this project. No officer or employee of such person retained by the municipality shall have any financial or other personal interest in any real property acquired for this project unless such interest is openly disclosed upon the public records or the municipality, and such officer, employee or person has not participated in the acquisition on or for the behalf of the municipality.

No member of or delegate to Congress shall be admitted to any share or part of this agreement, or to any benefit to arise hereupon, unless such benefit shall be the form of an agreement made with a corporation for its general benefit.

The municipality shall be responsible for enforcing the above conflict of interest provisions.

43. Pennsylvania Human Relations Act

See attached.

44. Pennsylvania Prevailing Wage Act and/or Davis-Bacon Act

1. A Prevailing Minimum Wage Predetermination has been made for this area and is hereby incorporated into and made a part of this Contract.

2. The following requirements are hereby incorporated in the specifications:

- A. The general prevailing minimum wage rates including contributions for employee benefits as shall have been determined by the Secretary which must be paid to the workmen employed in the performance of the Contract.

The Contractors shall pay no less than the wage rates as determined by the decision of the Pennsylvania Secretary of Labor and Industry and/or the U.S. Secretary of Labor and shall comply with the conditions of the Pennsylvania Prevailing Wage Act approved August 15, 1961 (Act No. 442), as amended August 9, 1963, Act. No. 342 and/or the Davis Bacon Act (Sec. 123 (a) (6) & (7) Reg. 51, 33), and the Regulations

assure the full and proper payment of said rates.

- B. Such workmen shall be paid no less than general prevailing minimum wage rates.
- C. The contract provisions shall apply to all work performed on the contract by the Contractor and to all work performed on the contract by all subcontractors.
- D. The Contractor shall insert in each of his subcontractors all of the stipulations contained in these required provisions and such other stipulations as may be required.
- E. No workmen may be employed on the public work except in accordance with the classifications set forth in the decisions of the Secretary. In the event that additional or different classifications are necessary the procedure set forth in these Regulations shall be followed.
- F. All workmen employed or working on the public work shall be paid unconditionally, regardless of whether any contractual relationship exists or the nature of any contractual relationship which may be alleged to exist between any Contractor, Subcontractor and workmen, not less than once a week without deduction or rebate, on any account, either directly or indirectly, except authorized deductions, the full amounts due at the time of payment, computed at the rate applicable to the time worked in the appropriate classifications. Nothing in the contract, the Acts or these Regulations shall prohibit the payment of more than general prevailing minimum wage as determined by the Secretary to any workmen on public work.
- G. The Contractor and each subcontractor shall post for the entire period of construction the wage determination decisions of the Secretary, including the effective date of any changes thereof, in a prominent and easily accessible place or places used by them to pay workmen their wages. The posted notice of wage rates must contain the following information:
 - 1) Name of project.
 - 2) Name of public body of which it is being constructed.
 - 3) The crafts and classifications of workmen listed in the Secretary's general prevailing minimum wage rate determination for the particular project.
 - 4) The general prevailing minimum wage rates determined for each craft and classification and the effective date of any changes.
 - 5) A statement advising workmen that if they have been paid less than the general prevailing minimum wage rate for their job classification or that the Contractor and/or subcontractor are not complying with the Acts or these

Regulations in any manner whatsoever they may file a protest in writing with the Pennsylvania Secretary of Labor and Industry or the U.S. Secretary of Labor within three (3) months of the date of the occurrence, objecting to the payment to any Contractor to the extent of the amount or amounts due or to become due to them as wages for work performed on the public work project. Any workmen paid less than the rate specified in the contract shall have a civil right of action for the difference between the wage paid and the wages stipulated in the contract which right of action must be exercised within six (6) months from the occurrence of the event creating such right.

- H. The Contractor and all subcontractors shall keep an accurate record showing the name, craft, and/or classification, number of hours worked per day, and the actual hourly rate of wage paid (including employee benefits) to each workman employed by him in connection with the public work and such record must include any deductions from each workman. The record shall be preserved for two years from the date of payment and shall be open at all reasonable hours to the inspection of the public body awarding the contract and to the Secretary or his duly authorized representatives.
- I. Apprentices shall be limited to such number as shall be in accordance with a bona fide apprenticeship program registered with and approved by the Pennsylvania Apprenticeship and Training Council and only apprentices whose training and employment are in full compliance with the provisions of the Pennsylvania Apprenticeship and Training Act approved July 14, 1961 (Act No. 304) and/or the Bureau of Apprenticeship and training, United States Department of Labor and the Rules and Regulations issued pursuant thereto shall be employed on the public work project. Any workman using the tools of a craft who does not qualify as an apprentice within the provisions of this subsection shall be paid the rate predetermined for journeymen in that particular craft and/or classifications.
- J. Wages shall be paid without any deductions except authorized deductions. Employers not parties to a contract requiring contributions for employee benefits which the Secretary has determined to be included in the general prevailing minimum wage rate shall pay the monetary equivalent thereof directly to the workmen.
- K. Payment of compensation to workmen for work performed on public work on a lump sum basis, or a piece work system, or a price certain for the completion of a certain amount of work, or the production of a certain result shall be deemed a violation of the Acts and these regulations, regardless of the average hourly earning resulting therefrom.

L. Each Contractor and each sub-contractor shall file a statement each week and a final statement at the conclusion of the work on the contract with the contracting agency, under oath, and in form satisfactory to the Secretary, certifying that all workmen have been paid wages in strict conformity with the provisions of the contract as prescribed in these regulations, or if any wages remain unpaid to set forth the amount of wages due and owing to each workman respectively.

M. The provisions of the Acts and these Regulations are herewith incorporated by reference in the contract.

3. See accompanying sheets for Prevailing Minimum Wage Rates as issued by the Pennsylvania Secretary of Labor and Industry and/or the U.S. Secretary of Labor. The prevailing minimum wage rates applicable to this project if required are included in the Form of Bid.

SPECIFICATIONS

SECTION 1.0 - GENERAL

1.1 SCOPE

The work to be included under this contract shall consist of furnishing all necessary labor, equipment, and material to install a new groin, construct a new boat launch ramp, gravel road and a storm sewer system at the Lakeside Recreation Area north of Lakeside Drive in the Township of Lawrence Park, Erie County, PA.

The approximate quantities for each item of work are shown in the Form of Bid; however, the Owner reserves the right to alter these quantities or delete some portions at their discretion.

1.2 INTENT

All work shown in the specifications and on the drawings shall be completed in every detail. There shall be no omission of anything necessary for the correct and satisfactory performance of the work.

1.3 VISIT TO THE SITE

Each bidder shall, before submitting his bid, visit the site of the work and familiarize himself with all the conditions under which the work is to be performed and the obstacles which may be encountered.

1.4 PROTECTION

The Contractor shall take whatever precaution may be necessary to secure any portion of the work. The contractor shall also furnish and maintain, at his own expense, necessary passageways, guard fences, lights and means of protection required by local conditions, laws, or ordinances.

1.5 MATERIAL AND WORKMANSHIP

All material and apparatus shall be new and of the grades, type and kind specified, and of the latest design and of standard manufacture.

All labor must be thoroughly competent and skilled in the respective trades. All labor shall be done in a neat and workmanlike manner, and in accordance with approved modern standards, practice and design.

1.6 ENGINEER SOLE JUDGE OF QUALITY AND SUITABILITY

All materials that are a part of the permanent construction as called for on the drawings and in these specifications shall be first class in every respect, and subject to the approval of the engineer. The engineer shall be the sole judge of material quality and suitability. The engineer shall be notified before the preparation, manufacture, inspection, or acceptance of any material, unless inspection has been authorized by the Engineer to be made at the project site or has been waived. If any material is condemned by the Engineer after arrival at the site, as unsuitable or not conforming to the specifications, the contractor shall immediately remove and replace such material even though it may have previously been satisfactorily passed by inspection.

1.7 MATERIAL TESTS

All material tests required by these specifications shall be made by a reliable testing laboratory approved by the Engineer. The Contractor shall supply and ship to the laboratory all materials to be tested; the cost of the materials and the tests shall be borne by the Contractor.

1.8 INSPECTION

All expense due to the inspection of any material or equipment required by the Engineer shall be borne by the Contractor. The Engineer is the sole judge for any material or equipment inspected at the mill.

General Conditions of the Specifications provide for proper inspection and testing of materials. Bureaus, laboratories and/or agencies used for inspection and testing are subject to the approval of the Engineer. Satisfactory documentary evidence that the material has passed the required inspection and testing must be furnished to the Engineer prior to its use; rejected material must be promptly removed from the premises.

The Engineer or his representative shall have access to the work at all times, and the Contractor shall provide proper facilities for such access and inspection.

The presence of the Engineer or his representative shall not relieve the Contractor of the responsibility of his contract, or by any warrant for the furnishing of bad material or workmanship.

1.9 PERMITS

The Contractor shall procure all necessary permits, certificates, etc., that are required for the performance of the work covered by these specifications and shall pay all fees and charges in connection therein. Occupancy, Department of Environmental Resources and Corps of Engineers approval are necessary for this project and shall be applied for by the Owner. The contractor shall be responsible for compliance with all DER and Corps of Engineers permit requirements.

1.10 UTILITIES

The location of existing piping and underground utilities, such as storm and sanitary sewers, shown on the Contract Drawings, has been determined from records and drawings of existing facilities. The Owner does not assume responsibility for utilities, other than those shown, different from the locations designated. The Contractor shall, at his own expense, furnish all labor and tools to either verify the record drawing location or locate the position of the facility.

Any utility, such as water mains, gas mains, telephone conduits, etc., that is disturbed or broken during construction shall be restored to its original condition and location. This restoration shall be at the Contractor's expense with no additional payment for either labor or materials. If a utility service is interrupted, the Contractor shall do everything humanly possible to restore service at the earliest possible moment.

1.11 RESETTING MANHOLES AND CATCH BASINS

All manholes, catch basins, and other appurtenances that may occur in the construction area shall be reset to conform to the finished grade.

1.12 PAYMENT

Payment will be based on the final measurements of the completed work for each item as listed in the Form of Bid. Payment for items that were bid on a cubic yard or on a tonnage basis must be substantiated by weigh slips or truck slips delivered to the site.

The Contractor shall submit copies, truck slips, or weigh bills to the Engineer for all materials delivered to the job site to ascertain quantities of these items for payment.

SECTION 3.0 - CONCRETE BOAT LAUNCH RAMP

3.1 WORK TO BE INCLUDED

Work included under this section consists of the removal of the existing concrete boat ramp and the construction of a new boat ramp along with related work in accordance with the sizes, lines, grade and at the locations specified on the Contract Drawings and in compliance with these specifications.

3.2 MATERIALS

All materials shall be furnished by an established and reputable supplier or manufacturer. All materials shall be of first class ingredients and construction, designed and guaranteed to perform the service required and conforming to the following specifications or a product similar and equal, approved by the Engineer.

The precast blocks used for the boat ramp construction shall be 2 feet in depth, 3 feet in width and 6 feet in length. The concrete mix shall be designed for 3300 psi compressive strength after 28 days, have a maximum slump of 4 inches, and consist of the following materials:

Cement	- Minimum of 6 bags/cu.yd.
Coarse Aggregate	- Approx. 1700 lbs./cu.yd.
Fine Aggregate	- Approx. 1500 lbs./cu.yd.
Water	- Maximum 30 gal./cy.yd.

The iron pins or rods used to anchor the precast concrete blocks in place shall have a minimum nominal diameter of 1-1/4 inches and a minimum length of 36 inches.

The materials used for cast in place concrete shall conform to the latest edition of the Pennsylvania Department of Transportation, Publication 408.

Class A Cement Concrete	Section 704.1 (e)
Curing and Protective Covers	Section 711.1
Concrete Curing Compound	Section 711.2
Concrete Admixtures	Section 711.3
Reinforcement Steel	Section 709.1 (a) 1
Expansion Joint Sealing Material	Section 705.4

The new concrete boat launch ramp shall be built to the line and grade shown on the construction details, or as directed by the Engineer.

The aggregate used in the concrete for this project shall be from sources currently approved by the Pennsylvania Department of Transportation and conform to their specifications, Publication 408.

The minimum cement content shall be 6.0 bags per cubic yard of concrete; all concrete shall have a 28 day compressive strength of 3300 PSI.

Fresh concrete shall contain from 4% to 7% of entrained air by volume. The Engineer or his representative may make necessary air entrainment changes to maintain the desired air content.

The controlled fill material shall be run-of-bank sand and gravel meeting the following requirements:

Gradation

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3"	100
3/8"	50 - 100
# 4	40 - 85
10	30 - 75
40	15 - 45
200	5 - 15

Liquid Limit, 25% - Maximum
Plasticity Index, 7 - Maximum

3.3 REMOVAL OF EXISTING BOAT LAUNCH RAMP

The existing concrete boat launch ramp shall be removed as shown on the plans or as directed by the engineer. The Contractor shall haul the concrete rubble from the existing boat ramp away from the site and legally dispose of it according to local regulations.

3.4 EXCAVATION

The Contractor shall excavate to sound shale or as directed by the Engineer. Shale, weathered shale, rock or organic material shall be disposed of off-site by the Contractor in accordance with local regulations. Sand and other soils may be used for backfilling in areas not requiring controlled fill.

3.5 CONSTRUCTION OF RAMP

After removing sand and other material and exposing the shale bed, the precast concrete blocks shall be placed to size, line and grade according to the Contract Drawings. A cast in place concrete cap shall be poured over the precast blocks to provide a uniform surface for placement of the ramp proper. At least two (2) anchor pins shall be placed in each top block. These anchors shall extend 4" above the required cap.

After the concrete block has been installed, the controlled fill shall be placed. The fill shall be placed in 8 inch loose lifts with the material near the optimum moisture content. The fill shall be compacted to 95% of the Standard Proctor (ASTM C698) density. A minimum of one (1) in-place density test shall be performed for each lift.

After the fill has been brought to the required grade, the ramp pavement shall be formed and poured.

3.6 FORMS

Forms must be supported so deflection does not exceed 1/4 inch under wet concrete. Forms shall be clean, and free of dirt chips, saw dust or other foreign materials.

Use forms that are strong, firm, securely braced, and tight enough to prevent leakage of mortar. When forms are insufficiently braced or unsatisfactorily built, the work will be halted, either before or during concreting, until such defects have been satisfactorily corrected. Chamfer the edges as indicated, and do not leave wood separators in the completed work.

Where required drench the inside of the forms with water immediately before placing concrete. Where required, coat forms with nonstaining form oil.

Forms shall not be removed from freshly placed concrete until it has set for at least 24 hours.

3.7 PLACING AND FINISHING CONCRETE

After mixing, the concrete shall be handled rapidly and successive batches placed in a continuous operation. Concrete shall be placed within 90 minutes after completion of mixing. Place concrete without segregation. Remove and discard any concrete which is segregated, too wet for use, or not of uniform consistency. Do not drop the concrete mixture a distance greater than 4 feet. Do not use partially hardened concrete. Do not place concrete when the air temperature is below 40° F, or above 100° F.

Finish the exposed concrete surfaces accurately and evenly, free from open or rough areas, and free from depressions or projections. In areas where reinforcement extends through construction joint do not place concrete adjacent to previously placed concrete until 24 hours has elapsed.

3.8 PLACING CONCRETE UNDER WATER

Concrete shall be placed in approximately horizontal layers, in a consolidated mass in its final position, using the tremie method or other acceptable method. The contractor shall use tight forms constructed to retain concrete under water. When using the tremie method, use a tremie with a hopper large enough to keep the discharge tube submerged in the fresh concrete.

3.9 CURING

Fresh concrete shall be protected and cured in a manner specified in section 1001.3(p) of the Pennsylvania Department of Transportation, Publication 408.

3.10 JOINTS

The ramp shall have transverse expansion joint the full width of the section at 20 foot intervals. Expansion joints shall consist of 1/2" premolded expansion joint filler. The top 1/2" shall be sealed using a rubberized joint sealing material meeting the requirements of the Pennsylvania Department of Transportation, Publication 408, Section 705.4.

Construction joints shall be avoided if possible. Construction shall be planned to end a days concrete placement at an expansion joint. If due to unavoidable conditions work is stopped prior to an expansion joint, the fresh concrete shall be squared and the exposed reinforcing cleared of concrete. Concrete shall not be placed adjacent to previously placed concrete until 24 hours have elapsed.

3.11 CONCRETE CONTROL TESTS

One set of 4 standard 6 inch concrete cylinders shall be made for every 50 c.y., of concrete placed with a minimum of one set of cylinders for each day of concrete placement. Cylinders shall be tested for compressive strength, on at seven days and three at 28 days. The costs of these tests shall be borne by the contractor.

3.12 DEFECTIVE CONCRETE WORK

If the concrete fails to meet the strength requirements, the Engineer shall direct the contractor to core the areas in question and compressive tests shall be made on the cores. If the core samples fail to meet the strength requirements the contractor shall remove the defective work. The cost of the cores, tests, removal and replacement of the defective work shall be borne by the Contractor.

3.13 BACKFILLING

Areas adjacent to the new concrete ramp may be backfilled with acceptable material after the concrete has set for 3 days or as directed by the Engineer.

3.14 PAYMENT

Payment for removal of existing boat launch ramp and replacement of new boat launch ramp shall include all labor, material and equipment necessary for the removal of existing concrete, proper disposal of all surplus material, installation of new concrete boat ramp, necessary backfill, and other required work, and shall be made at the unit price bid in the proposal on a cubic yard basis.

SECTION 6.0 - STORM SEWERS

6.1 WORK TO BE INCLUDED

The work to be included consists of the installation of corrugated metal pipe and reinforced concrete pipe sewer lines, catch basins, vaults, end wall, a rock lined channel and other related work in accordance with the sizes, lines, grade and at the locations shown on the Contract Drawings in compliance with these specifications.

6.2 MATERIALS

All materials shall be furnished by an established and reputable supplier or manufacturer. All materials shall be of first class ingredients and construction, designed and guaranteed to perform the service required and shall conform with the following specifications or shall be a product similar and equal thereto as approved by the engineer.

Corrugated metal pipe shall be galvanized or aluminized conforming to the AASHTO Specification M36 and the Pennsylvania Department of Transportation, Publication 408, Section 601. All metal pipe shall be Type I with the following properties:

15" cmp	14 gage	2 2/3 x 1/2	corrugated
21" cmp	14 gage	2 2/3 x 1/2	corrugated
42" cmp	12 gage	3 x 1	corrugated

Reinforced concrete pipe shall meet the requirements of AASHTO Specification M170 Class IV, wall B and the Pennsylvania Department of Transportation, Publication 408, Section 601.2.a.3.a.

Catch basins shall be Pennsylvania Department of Transportation, Publication 72, Standards for Roadway Construction Series RC-34 Type M inlet. Frames and grates shall be Allegheny Foundry Co., flanged state Type E or equal. The frame casting and grate casting shall have the metal bearing areas that come in contact machine ground to fit these two pieces as one unit; shall be marked as one unit; and shall be delivered as one unit.

Concrete used in the construction of the vaults, catch basins, and endwall shall meet the following requirements of the Pennsylvania Department of Transportation, Publication 408:

Class A, 3300 PSI, Cement Concrete	Section 704.1(e)
Concrete Admixtures	Section 711.3
Reinforcement Steel	Section 709.1

Mortar used for catch basins shall be machine mixed in an acceptable manner at the site by the Contractor and shall consist of 1 part Portland Cement and 2 1/2 parts fine aggregate by volume. Water or other components shall not be introduced into this mix after removal from the mixer.

Lumber used for sheeting may consist of any species which will satisfactorily stand driving. It shall be free from worm holes, loose knots, wind shakes, decayed or unsound portions, or other defects which might impair its strength or tightness. Minimum thickness shall be 2 inches nominal. Lumber for bracing shall be sound and shall be equal to or better than No. 2 Common Yard Lumber.

Special refill material for pipe bedding in rock excavation shall consist of #57 aggregate.

6.3 EXCAVATION

The contractor shall do all excavation of whatever substance encountered to the depth required to install the sewer to the lines and grades as shown on the plans. The banks of the trench shall be vertical. Width of the trench allowed shall be 12 inches on each side of the pipe. Excavated material not suitable or not required for fill or backfill shall be removed from the site and disposed of at the contractor's expense.

Excavation for manholes and catch basins shall allow for only 24 inches of clearance on all sides.

Excavation shall not be carried below the required level. Excess excavation shall be backfilled with sand, gravel, or concrete, as directed by the engineer, and thoroughly tamped at the contractor's expense.

Unstable soil shall be removed and replaced with approved backfill of gravel or crushed stone, which shall be thoroughly tamped at the contractor's expense. The engineer shall determine the depth of removal of the unstable soil.

The contractor shall remove by pumping, or other means approved by the engineer, any water accumulated in the excavation.

In rock, excavation shall be carried to 8 inches below the bottom of the pipe and special refill material shall be used to establish the proper grade by tamping thoroughly. This material shall be as stated in the materials section.

Whenever the work "Rock" appears in this specification, it shall be interpreted to mean material geologically in place and too hard to be removed from its original position with a modern three-quarter cubic yard backhoe power excavator in good condition without previously being broken up. Soft or weathered shale will not be considered rock and will not be paid for as a separate item, but shall be included in the unit price for the sewer line. No boulders less than 1/2 cubic yard in volume will be considered as rock.

Rock may or may not be encountered. When rock is encountered, the excavation operations shall be terminated until a method of excavation is approved by the engineer. Rock excavation shall be paid for as a separate item at the unit price bid in the proposal and shall include the unit price of the required special refill material to replace it as required and no extra payment shall be made over and above the unit price of rock excavation for replacement material.

The contract price for the installation of the sewer shall include the furnishing and installation of all sheeting, shoring, timbering, and bracing required to maintain the excavation in a condition to furnish safe working conditions and to permit the safe and efficient installation of all items of the contract work in strict accordance with all safety rules and regulations as prescribed by any governing organization.

The bottom of the trench shall be rounded so that an arc of the circumference equal to 0.6 of the outside diameter of the pipe rests on undisturbed soil.

6.4 JOINTS

The joint for corrugated metal pipe shall be made using single or two piece corrugated bands.

6.5 LAYING OF PIPE

All sewers shall be laid true to line and grade with the spirals upstream or upgrade. The sections of the pipe shall be laid and fitted together that when complete, the sewer will have a smooth and uniform invert. Each pipe shall be inspected for defects before being lowered into the trench, and if defects are found even after laying of the pipe is completed, it shall be removed and replaced with a new pipe at the Contractor's expense. No water shall be allowed in the trench while pipes are being laid, and the exposed end shall be capped if left in the trench for more than one (1) hour without installing the next section. Not more than 100 feet of trench shall be opened in advance of pipe laying unless permitted by the engineer.

The interior of the sewer shall be kept cleared of all dirt as the work progresses.

6.6 LINE AND GRADE

The Engineer will provide the Contractor with line and grade stakes, and it shall be the Contractor's responsibility to protect the original line and grade stakes. Should the stakes become destroyed or damaged, the cost of their replacement will be at the Contractor's expense.

It shall be the Contractor's responsibility to transfer the line and grade to the bottom of the ditch.

The Contractor must test the ditch or grade of the top line and sewer, and will be held responsible for the correct flow of the sewers. The Contractors must test the batter line with an accurate line level to test the downward grade of the pipe in the direction of flow. Three batter boards will be erected at all times to check the batter line. No claim for extra work will be allowed for alleged inaccuracy of grade stakes. Each pipe will be checked with a gauge rod and a plumb bob for line and grade. A laser beam system may be used if approved by the Engineer.

6.7 BACKFILL

No sewers shall be backfilled above the top of the pipe until the sewer elevations, gradient, alignment, and the pipe joints have been checked, inspected, and approved. No heavy rock or boulders more than 6 inches in diameter will be allowed within three (3) feet of the pipe, and no stones over 1 1/2 inches in diameter will be allowed in the first 18 inches of the backfill.

The space between the pipe and the side of the trench shall be backfilled in four-inch layers and thoroughly mechanically tamped until a height of one foot above the pipe is reached, and then layers of six inches will be allowed before the tamping is performed.

Backfill around catch basins shall be done after all forms, debris and trash are removed and cleared away. Suitable material as for trench backfilling shall be placed symmetrically on all sides in 8-inch layers. Each layer shall be thoroughly mechanically tamped.

All backfill shall be tamped thoroughly to the required grade around all manholes and other appurtenances as well as on the pipe line.

6.8 VAULTS

Vaults shall be constructed to the line and grade and at the locations noted on the Contraction Drawings.

All form work shall be constructed to true line and grade as shown on the contract drawings and shall be designed and built to conform to high quality construction practices outlined in section 1001.3 of Pennsylvania Department of Transportation, Pub. 408.

The forms shall be sufficiently tight to prevent leakage of grout or cement paste. The wood surface to be in contact with the concrete shall have an approved form oil or sealer applied unless it is covered with a factory applied non-absorptive liner.

The forms must not be removed until the concrete has hardened sufficiently to resist any damage from the removal operations, particular caution must be exercised when form ties will be bent by removal operations.

The vault inverts shall be paved to direct and convey the flow through the vault to the outlet pipe.

Special attention shall be given to protection of work in progress as large volumes of water can be expected at the 30" and 36" pipe outfalls.

6.9 ROCK LINED CHANNEL

Rock used in the channel lining shall meet the requirements of Pennsylvania Department of Transportation, Pub. 408, Section 850.2 with R-4 gradation. Geotextiles shall meet the requirements of a class 2 geotextile as specified in Section 735 of Pennsylvania Department of Transportation, Pub. 408.

The channel area shall be prepared for the geotextile by excavation, embankment, backfilling or other method as necessary. Fabric shall be placed over the prepared surface in a loose and unstretched condition to minimize shifting, puncturing or tearing of the fabric. Fabric shall be parallel with slope directions. Joints shall be single lock-type stitch with folded seam. Overlap shall be upslope over downslope.

6.10 ENDWALL

Concrete endwall shall be constructed to the dimensions of a type D-W endwall with a skew angle of 90° as detailed in the Pennsylvania Department of Transportation, Pub. 72, Standards for Roadway Construction Series RC-31.

6.11 CONCRETE CONTROL TESTS

One set of 4 standard 6 inch concrete cylinders shall be made for every 50 c.y., of concrete placed with a minimum of one set of cylinders for each day of concrete placement. Cylinders shall be tested for compressive strength, one at seven days and three at 28 days. The costs of these tests shall be borne by the contractor.

6.12 DEFECTIVE CONCRETE WORK

If the concrete fails to meet the strength requirements, the Engineer shall direct the contractor to core the areas in question and compressive tests shall be made on the cores. If the core samples fail to meet the strength requirements the contractor shall remove the defective work. The cost of the cores, tests, removal and replacement of the defective work shall be borne by the Contractor.

6.13 INTERFERENCES

Any interferences or obstacles encountered during construction not covered by unit price bid items and/or by detailed specifications elsewhere in these specifications or clearly shown on Contract Drawings shall be referred to the Engineer before proceeding with construction.

6.14 GRADING

Backfilling to the required grades shall be completed after the installation of the vaults and their related pipes. Backfill shall be brought up in 8 inch lifts, compacted to 95% of the standard proctor density (ASTM-D698), to 3 inches below finish grade. The backfill material shall consist of bank run gravel meeting the requirements of Section 3.2.

6.15 PAYMENT

A. 15-inch Galvanized Corrugated Metal Pipe-Type 1

Payment for the 15-inch galvanized corrugated metal pipe shall be made on a lineal foot basis measured from center line of catch basin to centerline of catch basin along the centerline of the storm sewer in place. The unit price bid per lineal foot shall include all excavation, galvanized corrugated metal pipe, connections, installation and backfill.

B. 21-inch Galvanized Corrugated Metal Pipe-Type 1

Payment for the 21-inch galvanized corrugated metal pipe shall be made on a lineal foot basis measured from centerline of catch basin to center line of vault along the centerline of the storm sewer in place. The unit price bid per lineal foot shall include all excavation, galvanized corrugated metal pipe, connections, and installation.

C. 42-inch Galvanized Corrugated Metal Pipe-Type 1

Payment for the 42-inch galvanized corrugated metal pipe shall be made on a lineal foot basis measured from centerline of vault to centerline of vault along the centerline of the storm sewer in place. The unit price bid per lineal foot shall include all excavation, galvanized corrugated metal pipe, connections and installation.

D. 48-inch Reinforced Concrete Pipe-Class IV

Payment for the 48-inch reinforced concrete pipe shall be made on a lineal foot basis measured from centerline of vault to end of pipe along the centerline of the storm sewer in place. The unit price bid per lineal foot shall include all excavation, reinforced concrete pipe and installation.

E. Grading

Payment for backfilling and grading around the vaults and the 21-inch, 42-inch and 48-inch pipes shall be made on a cubic yard basis as measured in place and calculated using average end area computations. The unit price bid shall include all labor, material and equipment necessary to complete the work as specified.

F. Catch Basins

Payment for catch basins shall be made at the unit price for each catch basin as bid in the proposal including excavation, catch basin, frame and grate castings and backfill complete in place and ready to use.

G. Rock Excavation

Payment for rock excavation, if encountered, shall be made on a cubic yard basis as provided for in the Form of Bid and shall include the depth from the top of rock to 8 inches below the pipe invert and a trench width of 12 inches on each side of pipe. The unit price bid per cubic yard shall include special refill material required for bedding and no extra payment shall be allowed for the special refill material over and above the unit price bid for rock excavation.

H. Unstable Material Replacement

Payment for material used in the replacement of unstable material shall be made on a cubic yard basis as provided for in the Form of Bid. The unit price bid shall include the cost of disposing of the material it replaces.

I. Wood Sheeting and Bracing

Payment for wood sheeting and bracing ordered left in place shall be on a thousand board feet unit price basis as provided for in the Form of Bid.

J. Vault 1 - Containing 30", 36" and 42" Pipe

Payment for Vault 1 shall be made on a lump sum basis consisting of excavation, all labor and material necessary to construct the cast in place structure, including the manhole frame and cover and the manhole steps, complete in place and ready to use.

K. Vault 2-Containing 21", 42" and 48" Pipes .

Payment for Vault 2 shall be made on a lump sum basis consisting of excavation, all labor and material necessary to construct the cast in place structure, including manhole frame and cover casting and manhole steps, complete in place and ready to use.

L. Endwall

Payment for the endwall shall be on a unit price basis for each endwall. The unit price bid shall include excavation, and all labor and material necessary to construct the cast in place structure, complete in place and ready to use.

M. Rock Lined Channel

Payment for the rock lined channel complete, in place and ready to use, shall be made on a lineal foot basis as provided for in the Form of Bid to include necessary base preparation, geotextile fabric, and stone.

SECTION 8.0 - CONCRETE GROIN

8.1 WORK TO BE INCLUDED

The work to be included is the installation of a new concrete block groin in accordance with the sizes, lines, grades and at the location shown as the Contract Drawings in compliance with the materials and Method of Construction outlined below, along with other related work required.

8.2 MATERIALS

All materials shall be furnished by an established and reputable supplier or manufacturer. All materials shall be of first class ingredients and construction, designed and guaranteed to perform the service required and conforming to the following specifications or a product similar and equal, approved by the Engineer.

The precast blocks used for the groin construction shall be 2 feet in depth, 3 feet in width and 6 feet in length. The concrete mix shall be designed for 3000 psi compressive strength after 28 days, have a maximum slump of 4 inches, and consist of the following materials:

Cement	- Minimum of 6 bags/cu.yd.
Coarse Aggregate	- Approx. 1700 lbs./cu.yd.
Fine Aggregate	- Approx. 1500 lbs./cu.yd.
Water	- Maximum 30 gal./cu.yd.

The iron pins or rods used to anchor the precast concrete blocks in place shall have a minimum nominal diameter of 1-1/4 inches and a minimum length of 36 inches.

8.3 EXCAVATION

The Contractor shall excavate all sand and other material to the shale bed for the entire length of the groin at the location shown on the Contract Drawings. All excavated material not required for fill or backfill shall be removed from the site and disposed of at the Contractor's expense.

8.4 PLACING PRECAST GROIN

After removing sand and other material, exposing the shale bed, the precast concrete blocks shall be placed to size, line and grade according to the Contract Drawings. As noted on the plans and as specified by the U.S. Army Corps of Engineers, the second course of blocks shall be placed to allow for a minimum of five - 2-foot openings in the lake area. The precast block shall be placed allowing for a minimum lap of 2-feet for each block.

Iron pins shall be grouted in the precast blocks and shale bed as shown on the Plans. Minimum number of iron pins shall be 2 per each 6 foot block and 3 for blocks exceeding 6-foot in length.

The top course shall be either poured in place or precast in a wedge shape to level the pier at an elevation of 1.0± feet above the lake level.

8.5 FORMS

The forms shall be made of straight material, placed to the proper grade and shall be straight-grained lumber at least one and five-eighths inches thick or of steel of equal strength and suitable for form use. The Township Engineer may upon inspection at any time condemn the use of either wood or steel forms, if in his opinion they are unfit for use. In no case shall forms be less than three and five-eighths inches in depth.

8.6 PLACING AND FINISHED CONCRETE

After mixing, the concrete shall be handled rapidly and the successive batches deposited in a continuous operation, until individual sections are completed. Under no circumstances shall concrete that has partly hardened be used. The forms shall be filled and the concrete brought to the established grade.

Concrete shall not be deposited when it appears likely that the air temperature may fall below 40 degrees F., during the pouring or within the following 24 hours unless preparations are made and precautions taken to prevent any damage to the concrete resulting from the low temperatures. When placing concrete in cold weather, the contractor shall plan and prosecute his work in a manner which will assure satisfactory results. Concrete shall not be deposited on a frozen foundation. Any concrete damaged by freezing shall be removed and replaced by the contractor at his own expense.

8.7 BACKFILLING

After the installation of the shore portions of the groins, the excavation shall be backfilled in tamped 8 inch lifts to the bottom of the top most block or as directed by the Engineer. The excavated on-site material shall be used in the backfilling operation.

8.8 LINE AND GRADE

The Engineer will provide the contractor with line and grade stakes, and it shall be the contractor's responsibility to protect the original line and grade stakes. Should the stakes become destroyed or damaged, the cost of their replacement will be at the contractor's expense.

It shall be the contractor's responsibility to construct the groin in accordance with the line and grade stakes established by the Engineer.

8.9 INTERFERENCES

Any interferences or obstacles encountered during construction not covered by these specifications or clearly shown on the Contract Drawings shall be referred to the Engineer before preceeding with construction.

8.10 PAYMENT

Payment for the new concrete groin complete in place shall be made on a lump sum basis as bid in the proposal. Payment shall include all excavation, material, form work, equipment and backfilling necessary to complete the item.

SECTION 9.0 - GRAVEL ROADWAY

9.1 WORK TO BE INCLUDED

The work to be included is the installation of a gravel roadway in accordance with sizes, lines, grades and at the location shown on the Contract Drawings and as specified herein along with other related work as required.

9.2 EXCAVATION

The contractor shall excavate all material encountered to a depth of 8 inches below proposed grade. All material not required for fill or backfill shall be removed from the site and disposed of at the contractor's expense.

9.3 MATERIALS

Material used for the roadway shall meet the specifications of Section 350 of Pennsylvania Department of Transportation, Pub. 408 with the following modifications: Percent passing the #200 sieve shall be between 6 and 12.

9.4 SUBGRADE

The subgrade shall be shaped to true line, elevation and full width. The sub-grade shall be thoroughly compacted by power rollers with a minimum weight of 10 tons to insure satisfactory densification and stabilization. It shall be compacted at optimum moisture content. The finish surface shall be uniformly shaped to facilitate drainage and any irregularities from the theoretical grade shall be corrected prior to placement of the roadway.

The prepared sub-grade shall be protected by the contractor to prevent undue rutting from trucks or other equipment, and if such damage does occur, the sub-grade shall be reshaped and compacted prior to placing the surface material.

9.5 SURFACE

The surface material shall be made of approved gravel or stone and shall have a minimum thickness at any point of eight (8) inches when compacted.

The surface material shall be placed evenly and rolled in two separate layers of at least four (4) inches each. Rolling shall be done with a three wheel-power roller weighing not less than 10 tons and shall begin at the sides and continue towards the center. Rolling shall continue until there is no movement of the surface ahead of the roller.

9.6 MISCELLANEOUS WORK

The bank on either side of the proposed road shall be cut back to the grades shown on the drawings and a drainage swale installed. This work shall be incidental to the gravel road construction.

9.7 PAYMENT

Payment for the gravel surface roadway complete in place including all excavation, grading, handling and disposal of material, preparation of sub-grade and construction of the gravel surface course shall be included in the unit price bid for installation of roadway as called for in the Form of Bid. Payment shall be on a square yard basis.

SECTION 10.0 - LANDSCAPING

10.1 WORK TO BE INCLUDED

Work to be included consists of supplying and placing topsoil, supplying and placing a soil reinforcing fabric, seeding, fertilizing and related work in accordance with the Contract Drawings and these specifications.

10.2 MATERIALS

Topsoil shall meet the requirements of the Pennsylvania Department of Transportation, Pub. 408, Section 802.2.

Soil reinforcement fabric shall be Enkamat 7020 as manufactured by American Enka Company, Enka, North Carolina 28728 or approved equal.

Seed formulas shall comply with the requirements of Pennsylvania Department of Transportation, Pub. 408, Section 804.2 (b) for formulas B and C.

Soil supplements shall consist of a commercial fertilizer with a 10-20-20 formulation.

10.3 METHOD OF CONSTRUCTION

After grading of areas to be covered with topsoil, loosen top 2 inches of soil, remove stones or other foreign materials 2 inches or larger and place topsoil to a compacted depth of 3 inches. Compaction shall be performed using a roller weighing not over 120 pounds per foot or width. Topsoil shall not be placed in a wet or frozen condition.

Apply fertilizer at the rate of 0.2 pounds per square yard.

In areas designated to receive Formula B spread seed at a rate of 0.2 pounds per square yard. Mulch using straw or wood-cellulose. Bind mulch using wood-cellulose or non-asphaltic emulsion ie., Terra Tack AR as manufactured by Grass Growers Company or equal.

Areas designated to receive seed formula C shall receive the soil reinforcing fabric. After the fertilizer has been applied, excavate a trench 12 inches deep and 6 inches wide around the entire new slope perimeter. The Enkamat shall be laid peak down starting at the upper end. The fabric shall be pinned at the upper and lower terminal trenches and at 3-5 foot intervals in between. Overlap shall be 3 inches on the side and 6 inches at roll ends. Pins shall be 8 to 11 gage wire U or T staples or wood stakes. Minimum penetration of pins shall be 8 inches.

Leguminous seed shall be inoculated with an inoculant consisting of a carrier and a nitrogen-fixing bacteria specific for the seed. Formula C shall be sown directly over the Enkamat at the rate of 0.01 pounds per square yard.

Areas seeded with formula B shall be rolled with a roller weighing not more than 65 pounds per foot of width.

Contractor shall restore areas disturbed in excess of 3 feet on either side of the trench at his own expense.

10.4 SEEDING DATES

Formula B may be sown from March 1 to June 1 and August 1 to October 1. Formula C may be sown at anytime except for September and October. The rye grass portion of Formula C may be sown in September and October with the crown vetch portion applied after October 31.

10.5 MEASUREMENT

Seeding for Formula B shall cover the area of the trench and 3 feet on either side. Area shall be measured on a square yard basis. Formula C areas shall be measured along the slope along the center line of each strip of the Enkamat with each strip width being taken as 36 inches. Area will be calculated on a square yard basis.

10.6 PAYMENT

A. Formula B Seeding

Payment for Formula B seeding shall be at the unit price as bid in the proposal on a square yard basis to include tillage, topsoil, seeding, soil supplements and rolling necessary to complete the items.

B. Formula C Seeding

Payment for Formula C seeding shall be at the unit price as bid in the proposal on a square yard basis to include tillage, topsoil, soil supplement, soil reinforcing fabric, seed and rolling necessary to complete the item.

FORM OF BID

FOR: Installation of a new groin, a new boat launch ramp, storm sewers, gravel roadway, and a rock lined channel in the Lakeside Recreation Area located in Lawrence Park Township, Erie County, Pennsylvania.

TO THE: Commissioners of Lawrence Park Township, Erie County, Pennsylvania.

Pursuant to and in accordance with your advertisement for bids dated _____ and in the information for bidders relating thereto, the undersigned hereby offers to furnish all plant, labor materials, equipment, supplies and other facilities and things necessary or proper for or incidental to the installation of a groin, a boat ramp, a gravel roadway, storm sewers and related structures on the Lakeside Recreation Area, located in Lawrence Park Township, Erie County, Pennsylvania, as required and in strict accordance with the Specifications and the Plans and all addenda issued by the Owner and mailed to the undersigned prior to the date of the opening of bids, whether received by the undersigned or not, complete in place for the unit indicated, which shall constitute the price for the job complete. The Commissioners reserve the right to increase or decrease the quantity of work as they deem necessary.

The quantities given are for bid comparison purposes only, the exact quantities for final payment will be based on actual field measurements of the completed work.

BID ITEMS

ITEM NO. 1

60 Cubic Yards of reinforced concrete to be placed for the new boat ramp to include removal and disposal of existing ramp, excavation, precast concrete block, concrete, reinforcement and backfill.

@ _____ Dollars (\$) per C.Y.
Complete in place

Total _____ Dollars (\$))

ITEM NO. 2

90 Lineal Feet of 15" Galvanized Corrugated Metal Pipe-Type 1 to include excavation, pipe, connections and backfill.

@ _____ Dollars (\$) per L.F. complete in place

Total _____ Dollars (\$))

ITEM NO. 3

82 Lineal Feet of 21" Galvanized Metal Pipe-Type 1 to include excavation, pipe connections and installation.

@ _____ Dollars (\$) per L.F. in place

Total _____ Dollars (\$))

ITEM NO. 4

30 Lineal Feet of 42" Galvanized Corrugated Metal Pipe-Type 1 to include excavation, pipe connections and installation.

@ _____ Dollars (\$) per L.F. in place

Total _____ Dollars (\$))

ITEM NO. 5

95 Lineal Feet of 48" Reinforced Concrete Pipe-Class IV to include excavation and installation.

@ _____ Dollars (\$) per L.F. in place

Total _____ Dollars (\$))

ITEM NO. 6

280 Cubic Yards Grading to include embankment construction and 21", 42" and 48" pipe backfilling.

@ _____ Dollars (\$) per C.Y.

Total _____ Dollars (\$))

ITEM NO. 7

3 each Catch Basins to include frames and grates, excavation and backfill.

@ _____ Dollars (\$) each complete
in place

Total _____ Dollars (\$))

ITEM NO. 8

75 Cubic Yards of Rock Excavation to include special refill material.

@ _____ Dollars (\$) per C.Y.

Total _____ Dollars (\$))

ITEM NO. 9

25 Cubic Yards of stone or gravel approved by the Pennsylvania Department of Transportation for replacement of unstable subgrade including the excavation and disposal of the unstable material.

@ _____ Dollars (\$) per C.Y. in place

Total _____ Dollars (\$) .)

ITEM NO. 10

1 Thousand board feet of wood sheeting and bracing ordered left in place.

@ _____ Dollars (\$) per M.B.F.
complete

Total _____ Dollars (\$))

ITEM NO. 11

1 Each Vault Type 1 to include excavation, concrete, reinforcement, manhole frame and cover casting, and steps.

Total _____ Dollars (\$) Lump Sum
complete in
place

ITEM NO. 7

3 each Catch Basins to include frames and grates, excavation and backfill.

@ _____ Dollars (\$) each complete
in place

Total _____ Dollars (\$))

ITEM NO. 8

75 Cubic Yards of Rock Excavation to include special refill material.

@ _____ Dollars (\$) per C.Y.

Total _____ Dollars (\$))

ITEM NO. 9

25 Cubic Yards of stone or gravel approved by the Pennsylvania Department of Transportation for replacement of unstable subgrade including the excavation and disposal of the unstable material.

@ _____ Dollars (\$) per C.Y. in place

Total _____ Dollars (\$) .)

ITEM NO. 10

1 Thousand board feet of wood sheeting and bracing ordered left in place.

@ _____ Dollars (\$) per M.B.F.
complete

Total _____ Dollars (\$))

ITEM NO. 11

1 Each Vault Type 1 to include excavation, concrete, reinforcement, manhole frame and cover casting, and steps.

Total _____ Dollars (\$)) Lump Sum
complete in
place

ITEM NO. 12

1 Each Vault Type II to include excavation, concrete, reinforcement, manhole frame and cover castings and steps.

Total _____ Dollars (\$)) Lump Sum
complete in
place

ITEM NO. 13

1 Each Endwall Penn DOT Type D-W to include excavation, concrete, and reinforcement.

Total _____ Dollars (\$)) Lump Sum
complete in
place

ITEM NO. 14

18 Lineal Feet of rock lined channel to include excavation, base preparation, geotextile fabric and stone.

@ _____ Dollars (\$)) per L.F. complete
in place

Total _____ Dollars (\$))

ITEM NO. 15

1 Each precast concrete groin , to include excavation, material, forms and backfilling.

Total _____ Dollars (\$)) Lump Sum
complete in
place

ITEM NO. 16

275 Square Yards of gravel roadway to include excavation, grading, handling and disposal of material, subgrade preparation and gravel surface.

@ _____ Dollars (\$)) per S.Y. complete
in place

Total _____ Dollars (\$))

ITEM NO. 17

260 Square Yards Formula B seeding to include tillage, topsoil, seed, soil supplements and mulch.

@ _____ Dollars (\$) per S.Y.
complete in
place

Total _____ Dollars (\$))

ITEM NO. 18

400 Square Yards Formula C seeding to include tillage, topsoil, soil supplements, soil reinforcing fabric and seed.

@ _____ Dollars (\$) per S.Y.
complete in
place

Total _____ Dollars (\$))

ITEM NO. 19

Sums of Items through 18 to constitute the total bid price for the job complete.

Total _____ Dollars (\$))

THE UNDERSIGNED ALSO AGREE AS FOLLOWS:

First: Within 30 days from the date of the Notice of Acceptance of this proposal, to execute the contract, and to furnish the Lawrence Park Township, Erie County, Pennsylvania, a satisfactory performance bond and a satisfactory labor and materials bond according to section nine (9) and section ten (10) of the Instructions to Bidders in the Specifications.

Second: To begin work on the date specified in the Notice to Proceed, and to prosecute said work in such a manner as to complete it within a reasonable time to be agreed upon by the Contractor and the Engineer.

Accompanying this proposal is a certified check or satisfactory bid bond for \$ _____, payable to Lawrence Park, Erie County, Pennsylvania, which is to be forfeited as liquidated damages if, in the event that this proposal is accepted, the undersigned shall fail to execute the contract and furnish satisfactory contract bond under the conditions and within the time specified in this proposal; otherwise said certified check or bid bond is to be returned to the undersigned.

Third: Neither the said bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest including this signer, has in any way colluded, conspired, connived or agreed, directly or indirectly, with any other bidder, firm or person to submit a collusive or sham bid in connection with the Contract for which the attached Bid has been submitted or refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, Firm or person to fix the price or prices in the attached cost element of Bid price or any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Owner or any person interested in the proposed Contract:

Also that the prices or prices quoted in the attached Bid are fair and proper and not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including the Signer.

Fourth: The Undersigned also agrees to pay workmen employed in the performance of the Contract no less than the wage rates as determined by the decision of the Pennsylvania Secretary of Labor and Industry and/or the U.S. Secretary of Labor and also agrees to comply with the conditions of the [Pennsylvania Prevailing Wage Act approved August 15, 1961 (Act No. 442), as amended August 9, 1963, Act No. 342 and/or] Davis Bacon Act (Sec. 123 (a) (6) & (7) Reg. 51, 33), and the Regulations issued pursuant thereto, to ensure the full and proper payment of said rates. A copy of the Minimum Wage Rates, if required, for this area as obtained by the Owner is included herewith.

Dated _____

If an individual, partnership or non-incorporated organization)

Signature of Bidder _____

By _____

Address of Bidder _____

Names and addresses of members of the firm

(IF A CORPORATION)

Signature of Bidder _____

By _____

Business Address _____

Incorporated under the laws of the State of _____

President	_____	_____
	Name	Address

Secretary	_____	_____
	Name	Address

Treasurer	_____	_____
	Name	Address

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